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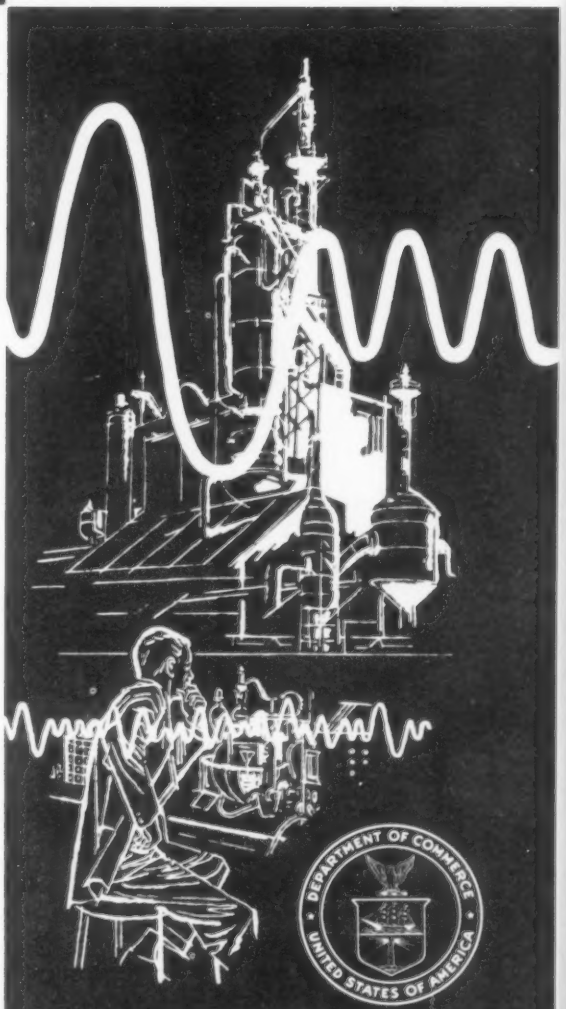

U. S. DEPARTMENT OF COMMERCE
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U.S. GOVERNMENT RESEARCH REPORTS

U.S. DEPARTMENT OF COMMERCE
Luther H. Hodges, *Secretary*

OFFICE OF TECHNICAL SERVICES

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*MUSCLES
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*NAVAL VESSELS (COMBATANT)
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*NAVAL VESSELS (COMBATANT)
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*NEOPLASMS
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*NICKEL
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*NICKEL ALLOYS
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*NIOBIUM ALLOYS

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*NIOBIUM ALLOYS
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*NIOBIUM ALLOYS
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*NIOBIUM ALLOYS
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*NITROGEN
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*NITROGEN, CARBON, OXYGEN RADICALS
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*NITROGEN HETEROCYCLICS
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*NITROGEN HETEROCYCLICS
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*NITROGEN HETEROCYCLICS (1 N)
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*ORGANIC COMPOUNDS
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*ORGANIC COMPOUNDS
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*ORGANIC COMPOUNDS
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*ORGANIC COMPOUNDS
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*ORGANIC COMPOUNDS
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WERE PHYSICALLY FRAGMENTED AND THEN FRACTIONATED BY DIFFERENTIAL CENTRIFUGATION. HIGH-ACTIVITY FRACTION WAS OBTAINED AND RETAINED ITS HIGH ACTIVITY REGARDLESS OF ENVIRONMENTAL CHANGES, AND HAD A LOW PROTEIN CONTENT, AND HIGH CHLOROPHYLL-TO-PROTEIN RATIO. PLASTOQUINONE WAS PRESENT IN HIGH CONCENTRATION.
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THIRD SEMI-ANNUAL RADIATION EFFECTS SYMPOSIUM, OCT. 1958. VOL. 3. AIRCRAFT SYSTEMS AND MATERIALS PAPERS.
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MAINTENANCE PERSONNEL

TRAINING, UTILIZATION, AND PROFICIENCY OF NAVY ELECTRONICS TECHNICIANS. PART IV. PROFICIENCY IN MATHEMATICS.
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*TRANSDUCERS (ACOUSTIC)
METAL PLATES

INTERLEAVED-PLATE ELECTRODYNAMIC TRANSDUCER, DESIGN AND PERFORMANCE.
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*TRANSDUCERS (ACOUSTIC)
WAVE ANALYZERS

INSTRUMENTATION AND PROCEDURES FOR DIGITAL-TO-ANALOG CONVERSION OF SONIC SURFACE SCANNER DATA FOR INPUT TO AN ANALOG WAVE ANALYZER.
AD-296 565 DIV. 30

*TRANSFORMERS
AUDIOFREQUENCY

DESIGN METHODS USED TO DESIGN HIGH POWER, HIGH VOLTAGE, AUDIOFREQUENCY TRANSFORMERS.
AD-296 438 DIV. 7

*TRANSISTORS
BONDING

PRODUCTION TECHNIQUES TO INCREASE RELIABILITY OF THE 2N914 AND 2N995 TRANSISTOR. BONDING TECHNIQUES FOR WIRE SYSTEMS, BINARY ALLOYS, SMALL BALL, CAPILLARY, AND ULTRASONIC BONDING ARE INCLUDED.
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*TRANSISTORS
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TECHNIQUES TO IMPROVE THE RELIABILITY OF GERMANIUM ALLOY TRANSISTORS TO A MAXIMUM OPERATING FAILURE RATE OF .05% PER 1000 HOURS AT A 90% CONFIDENCE LEVEL.
AD-296 770 DIV. 8

*TRANSISTORS
GERMANIUM ALLOYS

TRANSIENT AND STEADY-STATE NUCLEAR RADIATION EFFECTS ON GERMANIUM PNP ALLOY TRANSISTORS.
AD-296 283 DIV. 7

*TRANSISTORS
MANUFACTURING METHODS

LIMITED PRODUCTION FACILITY USING PROTOTYPE EQUIPMENT CAPABLE OF PRODUCING PARTS DIRECTED TOWARDS A RATE OF 200 TRANSISTORS PER 8 HOUR SHIFT.
AD-296 315 DIV. 8

*TRANSISTORS
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TRANSIENT AND STEADY-STATE NUCLEAR RADIATION EFFECTS ON GERMANIUM PNP ALLOY TRANSISTORS.
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*TRANSISTORS
SEMICONDUCTING FILMS

INSULATED-GATE CADMIUM SULFIDE THIN FILM TRANSISTOR CURRENT CONTROL MECHANISM.
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*TRANSITION ELEMENTS
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*TRANSMISSION LINES
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*TRANSPONDERS
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LIFE TESTS WERE CONDUCTED ON BOL-RT-5A RADAR BEACON TRANSPONDER WITH SIX COMMAND DECODER.
AD-296 907 DIV. 30

*TRANSPONDERS
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LIFE TESTS WERE CONDUCTED ON BOL-RT-5A RADAR BEACON TRANSPONDER WITH SIX COMMAND DECODER.
AD-296 907 DIV. 30

*TRANSPONDERS
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LIFE TESTS WERE CONDUCTED ON BOL-RT-5A RADAR BEACON TRANSPONDER WITH SIX COMMAND DECODER.
AD-296 907 DIV. 30

*TRANSPORT PROPERTIES
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EFFECT OF CLOSE COLLISIONS ON THE TWO-BODY DISTRIBUTION FUNCTIONS IN A PLASMA.
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*TRAVELING WAVE TUBES
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HIGH POWER CRESTATRONS FOR THE 100-300 MC FREQUENCY RANGE; ELECTRO.
AD-296 901 DIV. 8

*TRAVELING WAVE TUBES
HIGH FREQUENCY

HIGH POWER CRESTATRONS FOR THE 100-300 MC FREQUENCY RANGE; ELECTRO.
AD-296 901 DIV. 8

*TRAVELING WAVE TUBES
S BAND

FERRITE STACKS AND ALNICO 5 PERMANENT MAGNETS ARE BOTH USED IN FOCUSING THE BEAM IN A TRAVELING-WAVE TUBE.
AD-296 410 DIV. 8

*TREES
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JUNGLE CANOPY PENETRATION; DIFFUSION MEASUREMENT BY AEROSOL DISTRIBUTION ON JUNGLE VEGETATION.
AD-296 567 DIV. 2

JUNGLE CANOPY PENETRATION; VEGETATION AND METEOROLOGICAL STUDIES OF TROPICAL FOREST; PLANT GROWTH AND RAINFALL RELATIONSHIPS.
AD-296 572 DIV. 2

*TRIGONOMETRY
CURVED PROFILES

SZ BEARING ANGLE ERROR RESULTING FROM SENSOR SITING ERRORS ON ANALYSIS OF THE ACCURACY OF ANTENNA LOCATION.
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*TROPICAL REGIONS
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JUNGLE CANOPY PENETRATION; VEGETATION AND METEOROLOGICAL STUDIES OF TROPICAL FOREST; PLANT GROWTH AND RAINFALL RELATIONSHIPS.
AD-296 572 DIV. 2

*TROPICAL REGIONS
VENTILATION

JUNGLE CANOPY PENETRATION; DIFFUSION MEASUREMENT BY AEROSOL DISTRIBUTION ON JUNGLE VEGETATION.
AD-296 567 DIV. 2

*TRYPSIN
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KINETICS OF LACTIMIZATION OF METHYL ESTERS OF SOME N-TOLUENE-P-SULFONYL DERIVATIVES OF DIAMINO ACIDS IN AQUEOUS SOLUTION; REACTION KINETICS OF THROMBIN AND TRYPSIN.
AD-296 587 DIV. 16

*TUNGSTEN
EROSION

TUNGSTEN EROSION UNDER SIMULATED ROCKET EXHAUST CONDITIONS.
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*TUNING FORKS
ATMOSPHERIC SOUNDING

TWO TYPES OF VIBRATORY GYROS TO DETECT VERY LOW RATES OF TURN; ONE USES PIEZOELECTRIC CERAMICS AND THE OTHER USES TUNING FORKS.
AD-296 397 DIV. 12

*TURBOJET ENGINES
ENERGY MANAGEMENT

CRUISE CONTROL OF TURBOJET AIRCRAFT.
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*TURBOJET ENGINES
TEMPERATURE

IN-FLIGHT TEMPERATURE INSTRUMENTATION IN COCKPITS AND ENGINE COMPARTMENTS FOR JET FIGHTER AND ATTACK BOMBER AIRCRAFT.
AD-296 912 DIV. 1

*ULTRASONIC RADIATION
SPECTROSCOPY

FLAW DETERMINATION BY ULTRASONIC SPECTROSCOPY.
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*UNDERWATER EXPLOSIONS
EXPLOSION BUBBLES

UNDERWATER EXPLOSION PHENOMENA: THE PARAMETERS OF MIGRATING BUBBLES, EQUATION FOR THE BUBBLE ENERGY RATIO, SURFACE CORRECTION TERM, MIGRATION COEFFICIENT, ENERGY OF MIGRATING BUBBLES.
AD-296 486 DIV. 22

*UNDERWATER OBJECT LOCATORS
ACOUSTIC FILTERS

ACOUSTIC FILTERS USED FOR DETECTING MOVING UNDERWATER OBJECTS.
AD-296 596 DIV. 6

*UNDERWATER SOUND GENERATORS
SONAR

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AD-296 751 DIV. 6

*UNITED STATES GOVERNMENT
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THIS BIBLIOGRAPHY REPRESENTS A SELECTED PORTION OF THE HOLDINGS OF THE AIR FORCE ACADEMY ON AMERICAN NATIONAL GOVERNMENT.
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*VANADIUM ALLOYS
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AD-296 760 DIV. 17

*VANADIUM ALLOYS
TENSILE PROPERTIES

EVALUATION OF TENSILE PROPERTIES OF VANADIUM ALLOYS CONTAINING NIOBIUM, HAFNIUM, TANTALUM, ZIRCONIUM, RUTHENIUM, TUNGSTEN, OR MOLYBDENUM.
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*VARIABLE RESISTORS
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PRODUCTION FACILITIES FOR MULTI-TURN METAL-FILM TRIMMER RESISTORS.
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MEASUREMENT

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***VENUS**
ATMOSPHERE MODELS

VENUS ATMOSPHERE ENTRY USING TWO ATMOSPHERE MODELS.
AD-896 070 DIV. 2

***VENUS**
PLANETARY ATMOSPHERES

VENUS ATMOSPHERE ENTRY USING TWO ATMOSPHERE MODELS.
AD-896 070 DIV. 2

***VISCOELASTICITY**
LINEAR SYSTEMS

GENERALIZATIONS TO LINEAR QUASI-STATIC VISCOELASTICITY THEORY OF CERTAIN VARIATIONAL PRINCIPLES WHICH CHARACTERIZE THE SOLUTION OF THE MIXED BOUNDARY-VALUE PROBLEM OF CLASSICAL ELECTROSTATICS.
AD-896 850 DIV. 9

***VISCOELASTICITY**
MECHANICAL PROPERTIES

DETERMINATION OF VISCOELASTIC MODEL CONSTANTS FROM DYNAMIC MECHANICAL PROPERTIES OF LINEAR VISCOELASTIC MATERIALS.
AD-896 848 DIV. 9

***VISION**
ADAPTATION (PHYSIOLOGY)

TO EVALUATE THE PROBLEM OF FLASH BLINDNESS. THE EFFECTS ON RECOVERY TIME OF PUPILLARY SIZE (DECREASED BY MIATICS), FLASH INTENSITY, TESTING PATCH LUMINANCE, AND SUBJECT VARIABILITY WAS STUDIED IN SUBJECTS EXPOSED TO INTENSE LIGHT FLASHES.
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***VITAMIN B COMPLEX**
SPECTROSCOPY

ELECTRICAL AND MAGNETIC PROPERTIES OF ORGANIC SOLIDS. COMPLEXES OF RIBOFLAVIN AND ITS DERIVATIVES WITH AROMATIC PHENOLS IN SOLUTION AND IN SOLID STATE.
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AD-896 193 DIV. 7

***VOLUMETRIC ANALYSIS**
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***WAKE**
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ACOUSTIC FILTERS USED FOR DETECTING MOVING UNDERWATER OBJECTS.
AD-896 594 DIV. 6

***WASTES (SANITARY ENGINEERING)**
WATER SUPPLIES

EVALUATION AND DEVELOPMENT OF A THEORY FOR THE DESIGN OF SEWAGE STABILIZATION PONDS.
AD-896 173 DIV. 13

***WATER WAVES**
MAGNETO-OPTIC EFFECT

DEVELOPMENT OF C-BAND BEACON FERRITE DUPLEXER, PROGRESS IN DESIGN OF GYROMAGNETIC COUPLER, RESONANCE, AND VARACTOR LIMITERS.
AD-896 923 DIV. 8

***WAVE ANALYZERS**
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INSTRUMENTATION AND PROCEDURES FOR DIGITAL-TO-ANALOG CONVERSION OF SONIC SURFACE SCANNER DATA FOR INPUT TO AN ANALOG WAVE ANALYZER.
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***WAVE TRANSMISSION**
FUNCTIONS

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AD-896 970 DIV. 15

***WAVEFORM GENERATORS**

HIGH TEMPERATURE PULSE FORMING NETWORK - Z-2922.
AD-896 139 DIV. 8

***WEAPON SYSTEMS**
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BSPACS WEAPON SYSTEM PROGRAMMING AND CONTROL SYSTEM.
AD-896 946 DIV. 18

***WEAPON SYSTEMS**
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BSPACS WEAPON SYSTEM PROGRAMMING AND CONTROL SYSTEM.
AD-896 946 DIV. 18

***WEATHER FORECASTING**
ANALYSIS

OBJECTIVE AND DYNAMICAL STUDIES OF TROPICAL WEATHER PHENOMENA: APPLICATIONS TO TROPICAL WEATHER FORECASTING.
AD-896 408 DIV. 3

***WEATHER FORECASTING**
TROPICAL REGIONS

OBJECTIVE AND DYNAMICAL STUDIES OF TROPICAL WEATHER PHENOMENA: APPLICATIONS TO TROPICAL WEATHER FORECASTING.
AD-896 408 DIV. 3

***WELDING**
BIBLIOGRAPHIES

BIBLIOGRAPHY CONCERNING THE CHARACTERISTICS OF THE ARC IN TUNGSTEN, INERT GAS AND METALLIC INERT GAS WELDING.
AD-896 350 DIV. 17

BIBLIOGRAPHY ON THE VARIOUS METHODS OF WELDING TITANIUM AND TITANIUM ALLOYS.
AD-896 384 DIV. 17

BIBLIOGRAPHY ON THE PHYSICAL PROPERTIES AND WELDABILITY OF NICKEL AND NICKEL ALLOYS.
AD-896 385 DIV. 17

***WELDING**
ULTRASONIC RADIATION

POWER-FORCE PROGRAMMING DURING THE WELDING INTERVAL TO IMPROVE THE QUALITY OF WELDS IN REFRACTORY METALS.
AD-896 378 DIV. 17

***WIND TUNNEL MODELS**
MAGNETIC PROPERTIES

A BIBLIOGRAPHY ON THE MAGNETIC SUSPENSION OF WIND TUNNEL MODELS.
AD-896 400 DIV. 1

***WINGS**
JETS

MODEL TESTS OF WING TIP BLOWING FOR DRAG REDUCTION ON TAKE-OFF AND LANDING.
AD-896 103 DIV. 9

***WIRE**
BIBLIOGRAPHIES

AN ANNOTATED BIBLIOGRAPHY ON THE EXPLODING WIRE PHENOMENA (1958- SEPTEMBER 1962).
AD-896 359 DIV. 25

***WIRE**
EXPLOSIONS

AN ANNOTATED BIBLIOGRAPHY ON THE EXPLODING WIRE PHENOMENA (1958- SEPTEMBER 1962).
AD-896 359 DIV. 25

***WOOD**
DEGRADATION

ABYSSAL CORROSION AND ITS MITIGATION. RESULTS OF EXPOSURE OF VARIOUS MATERIALS (METALS AND NON-METALLIC MATERIALS) AT SEVERAL DEPTHS UP TO 500 FT IN TONGUE OF THE OCEAN FOR 3-1/2 MOS.
AD-896 948 DIV. 17

***WOOD**
MECHANICAL PROPERTIES

BIBLIOGRAPHY ON MECHANICAL PROPERTIES AND STRUCTURAL USES OF WOOD: INCLUDING LAMINATES: PLYWOOD, AND VENEERS.
AD-896 504 DIV. 14

***WOOD**
PROCESSING

MODIFIED WOODS. CHEMICAL AND PHYSICAL TREATMENTS WHICH MODIFY DIMENSIONAL STABILITY AND MECHANICAL PROPERTIES OF WOOD. PHENOLIC-RESIN IMPREGNATION.
AD-896 505 DIV. 14

***WOOD PULP**
PAPER

EFFECT OF TEMPERATURE AND RESTRAINT DURING DRYING ON THE TENSILE PROPERTIES OF HANDSHEETS PREPARED FROM BLEACHED SOUTHERN PINE KRAFT PULP.
AD-896 506 DIV. 14

***WORK FUNCTIONS**

CESIUM VAPOR-FILLED THERMIONIC CONVERTERS HAVING IRIDIUM EMITTERS.
AD-896 020 DIV. 7

***X RAYS**
MEASUREMENT

THE PHYSICAL PROPERTIES OF MARINE CLAY SOILS.
AD-896 801 DIV. 2

TECHNICAL ABSTRACT BULLETIN

1. AIRCRAFT AND FLIGHT EQUIPMENT

AD-296 131 Div. 1, 9, 6
(TISTA/GEC) OTS price $1.60

Anti-Submarine Warfare Lab., Naval Air Development Center, Johnsville, Pa.
RESEARCH AND DEVELOPMENT PROGRAM FOR AIRBORNE TOWED VEHICLES.
Phase rept.,
by J. R. Lehn. 8 Jan 63, 9p. incl. illus. (Rept. no. NADC-AW-6229)
Unclassified report

DESCRIPTORS: *Magnetometers, Aerodynamic characteristics, Flight testing, Stability, Submarines, Antisubmarine aircraft, Airborne, Towed bodies.

A phase I instrumentation system was developed to determine the dynamic flight characteristics of MAD airborne towed vehicles. Flight tests were performed employing the most recently modified towed vehicle, improved to house the AN/ASQ-46 MAD set. The flight tests established that the angular accelerations, measured by the phase I instrumentation system, did not require a dynamic response beyond the stabilization capability of the magnetometer servo system. The static pressure variations measured at the aircraft were in close agreement with those recorded at the towed vehicle. This fact indicates that the ability of the towed vehicle to follow the aircraft motion is excellent. An analytical study revealed that at a velocity of 150 knots and a tow cable length of 250 ft the towed vehicle should fly in a stable manner. Further flight testing should determine the degree of correspondence between measured static pressure variations and actual altitude variations. (Author)

AD-296 190 Div. 1
(TISTA/FRL) OTS price $8.10

Airesearch Mfg. Co., Phoenix, Ariz.
GEM PROPULSION SYSTEM STUDY.
Progress rept., 30 Nov 61-30 Nov 62,
by Y. Senoo. 7 Dec 62, 72p. incl. illus. 4 refs. (Rept. no. AP-5062-R)
(Contract Nonr-3024)
Unclassified report

DESCRIPTORS: *Ground effect machines, Ducted fans, Ducts, Design, Tests, Fans.

The duct system is designed beforehand and the fan is designed to meet the duct dimensions at the exit of the fan. The problems related to duct design are discussed. The inlet and exit conditions of a fan are also discussed. Problems related to the fan design are presented. Using these basic considerations, a typical fan and vaned type delivery duct was designed and tested. The detail design is presented. (Author)

AD-296 225 Div. 1, 9
(TISTA/GEC) OTS price $17.00

AiResearch Mfg. Co., Phoenix, Ariz.
GEM CONTROL SYSTEMS STUDY.
Progress rept., Nov 61-Nov 62,
by B. W. Andersen, R. V. Boyle, and O. A. Becker. 7 Dec 62, 261p. incl. illus. tables, 4 refs.
(Rept. no. AP-5061-R)
(Contract Nonr-3173)
Unclassified report

DESCRIPTORS: *Ground effect machines, Pitch (Motion), Yaw, Roll, Stability, Aerodynamic characteristics, Simulation, Flight testing, Hovering, Mathematical prediction, Equations, Flight control systems.

Study of GEM control systems continued. Six equations of motion were applied to peripheral jet vehicles. Surface effects of normal waves and two-dimensional wake were simulated on flat surfaces. Air moving equipment was simulated. These simulations were considered sufficient for specifying control systems. Control simulations gave the pilots good command of vehicle motion. Pilot read out was insufficient for the pilot to sense motion. Flight tests were made in a test vehicle with various control systems.

AD-296 400 Div. 1, 7, 8, 9, 30
(TISTE/OHD) OTS price $3.60

Arnold Engineering Development Center, Arnold Air Force Station, Tenn.
BIBLIOGRAPHY: THE MAGNETIC SUSPENSION OF WIND TUNNEL MODELS,
by P. L. Clemens and A. H. Cortner. Feb 63, 34p. (Rept. no. AEDC TDR 63-20)
(Contract AF 40(600)1000)
Unclassified report

DESCRIPTORS: *Wind tunnel models, *Suspension devices, *Bibliographies, Wind tunnels, Magnetic fields, Telemeter systems, Control systems, Magnetic properties.

This is a selective bibliography of the literature on the magnetic suspension of wind tunnel models including a chronological arrangement of titles and abstracts under four main headings: magnetic suspension for aerodynamic testing; non-aerodynamic applications of magnetic suspension; magnetic circuits and their electronic controls; and telemetry from magnetically supported aerodynamic models. An introduction presents a resume of the state-of-the-art of magnetic model suspension technology. (Author)

AD-296 530 Div. 1
(TISTA/GEC) OTS price $7.60

Douglas Aircraft Co., Inc., Long Beach, Calif.
CRUISE CONTROL OF TURBOJET AIRCRAFT,
by C. G. Livingston. 21 Jan 62, 75p. incl. illus. 15 refs. (Rept. no. LB 31183)
(Contract Nonr-107600)
Unclassified report

DESCRIPTORS: *Jet propulsion, *Turbojet engines, Control systems, Fuel consumption, Flight paths, Drag, Display systems, Wind, Automatic pilots, Mathematical analysis, Operations research, Energy management.

A general technique is presented for cruise control of turbojet powered aircraft. The technique is evolved through the effects of imposed constraints and external forces to an integrated display system that will enable the pilot to optimize cruise management under all realistic conditions. Requirements are defined and the preliminary effort necessary for the commencement of a program for development of the total system is completed.

AD-296 806 Div. 1, 12, 13, 32
(TISTE/OHD) OTS price $2.60

Lockheed Aircraft Corp., Sunnyvale, Calif.
THEORY OF OPTIMUM STRUCTURES: AN ANNOTATED BIBLIOGRAPHY,
comp. by G. R. Evans and R. A. Eisentraut.
Oct 62, 23p. (Special bibliography no. SB-62-49; Rept. no. 5-10-62-38)
Unclassified report

DESCRIPTORS: *Structures, *Bibliographies, Structural shells, Metal plates, Beams (Structural), Structural parts, Weight.

AD-296 870 Div. 1, 27
(TISTW/JEA) OTS price $1.60

Air Force Proving Ground Command, Eglin Air Force Base, Fla.
PRELIMINARY FIT TESTS OF U. S., BRITISH, AND FRENCH ROCKET LAUNCHERS ON F-100D AND F-105D AIRCRAFT,
by D. G. Cox. Feb 63, 17p. incl. illus. (Rept. no. APGC TDR 63-11)
(Proj. 0014W)
Unclassified report

DESCRIPTORS: *Rocket launchers, *Adapters, Fastenings, Airborne, Rocket motors, Rocket components, Rocket igniters, Rocket cases, Flight testing, Electric switches, Aircraft, Electric connectors.

AD-296 912 Div. 1
(TISTA/LSK) OTS price $1.60

Naval Ordnance Test Station, China Lake, Calif.
IN-FLIGHT TEMPERATURE ENVIRONMENTS OF JET FIGHTER AND ATTACK BOMBER AIRCRAFT INSTRUMENTATION,
by Howard C. Schafer. Dec 62, 16p. incl. illus. table (NOTS TP 2973)
(NAVWEPS rept. 7939) Unclassified report

DESCRIPTORS: *Cockpits, *Turbojet engines, *Temperature warning systems, Flight instruments, Measurement, Thermocouples, Jet fighters, Attack bombers, Jet bombers, Temperature, Jet planes.

AD-296 915 Div. 1, 9
(TISTA/GEC) OTS price $7.60

Technology, Inc., Dayton, Ohio.
STUDY OF PARACHUTE SCALE EFFECTS.
Final rept., 15 Feb-15 Nov 62,
by William B. Walcott. Jan 63, 70p. incl. tables, 122 refs.
(Contract AF 33(657)8073, Proj. 6065)
(ASD TDR 62-1023) Unclassified report

DESCRIPTORS: *Parachutes, *Ribbon parachutes, Drag, Aerodynamic characteristics, Stability, Design, Subsonic flow, Mathematical analysis, Equations, Scale.

A study was conducted to determine the effects of changing scale upon drag coefficient, filling time, peak opening force, and stability for single, unreefed textile parachute canopies. The investigation was confined to Flat Circular, Extended Skirt, Ringslot, Ribless Guide Surface, Circular Flat Ribbon, and Conical Ribbon parachutes operating in the subsonic flow regime at altitudes below 20,000 ft. As an integral part of the study, a survey of the existing literature and test data, a compilation of all pertinent data, and recommendations for future experimental investigations were made. Scaling equations with associated 95% confidence intervals were developed for the drag coefficient of the Flat Circular and Extended Skirt parachutes through the use of a multiple regression analysis which indicates the significant variables and their functional forms. Because the available data was poorly distributed, the equations will have to be used circumspectly to avoid misleading conclusions. (Author)

2. ASTRONOMY, GEOPHYSICS AND GEOGRAPHY

AD-296 070 Div. 2, 12
(TISTA/GEC) OTS price $6.60

RAND Corp., Santa Monica, Calif.
ESTIMATES OF FLIGHT REGIMES IN THE VENUS ATMOSPHERE,
by Peter P. Wegener. Jan 63, 56p. incl. illus. tables, 30 refs. (Research memo. no. RM-2946-PR)
(Contract AF 49(638)700, Proj. RAND)
Unclassified report

DESCRIPTORS: *Venus, *Descent trajectories, Venus probes, Theory, Troposphere, Atmosphere entry, Flight, Planetary atmospheres, Atmosphere models, Aerodynamic characteristics.

The atmosphere of Venus is discussed on the basis of existing evidence. In view of the possible aerodynamic effects of the atmosphere of Venus, the findings reported in the literature are categorized conservatively as either accepted or uncertain. Two limiting atmospheric models and some variants are constructed with the intent of encompassing the range of uncertainty of responsible opinion. Free-flight Mach numbers and Reynolds numbers as a function of altitude are computed for these models, and a simple entry trajectory and satellite flight conditions are discussed in terms of these models. It was found that the aerodynamic problems of the troposphere are very different for the limiting models. It was further seen that the continuum flight regime is entered at altitudes between about 150 and 80 km above the visible cloud layer, depending on the models used. Finally, chemical kinetics problems, heat transfer, etc., are expected to show major variations. (Author)

AD-296 128 Div. 2
(TISTB/MB) OTS price $1.10

Northwestern U., Evanston, Ill.
(No title).
Annual summary rept.,

by Karl G. Henize. Dec 62, 3p.
(Contract Nonr-122819, Proj. NR 046-786)
Unclassified report

DESCRIPTORS: *Astronomy, Astrophysics, Photography, Nebulae, Stars, Line spectrum, Band spectrum, Astronomical data.

AD-296 134 Div. 2, 11, 22
(TISTW/PCR) OTS price $10.10

Southwest Research Inst., San Antonio, Tex.
A STUDY OF THE FEASIBILITY OF DEVELOPING OVERLAY MAPS TO INDICATE PERFORMANCE CAPABILITIES OF ORDNANCE EQUIPMENT IN SELECTED WORLD ENVIRONMENTS,
by Carroll G. Robinson and Howard M. Bunch.
June 62, 114p. incl. illus. tables, 7 refs.
(Contract DA 23-072-ORD-1375, Proj. 598-09-004)
Unclassified report

DESCRIPTORS: *Terrain, *Vehicles, *Performance tests, Feasibility studies, Tanks (Combat vehicles), Armored vehicles, Cargo vehicles, Deserts, Reliability, Soil mechanics, Meteorological parameters, Correlation techniques, Atmospheric temperature, Trafficability, Climatology, Test methods, Map projection, Maps, Analog systems.

An evaluation is given of a specific methodology for attempting to predict performance of Ordnance self-propelled vehicles in selected world environments using presently available vehicle test data and world geographical data as inputs. Vehicles selected for evaluation were: tank, 90mm gun, full-tracked, M48; carrier, personnel, armored, full-tracked, M113; truck, cargo, 2-1/2-ton, M35; and carrier, light weapons, infantry, 4 X 4, M274. The South Asian desert was the geographical area used in the evaluation. General performance limits of a vehicle can be plotted for a given area. However, the degree of reliability of these plots is severely limited by the lack of definitive data relating vehicle performance to precise soil and terrain definitions. Suggestions were given for improving the system. (Author)

AD-296 160 Div. 2
(TISTP/FR) OTS price $15.50

Wisconsin U., Madison.
STUDIES OF THE THREE-DIMENSIONAL STRUCTURE OF THE PLANETARY BOUNDARY LAYER.
Final rept.,
by Heinz H. Lettau. Oct 62, 235p. incl. illus. tables, 21 refs.
(Contract DA 36-039-sc-80282)
Unclassified report

DESCRIPTORS: *Micrometeorology, Meteorological instruments, Towers, Lakes, Temperature, Atmosphere, Lapse rate, Photographic analysis, Terrain, Infrared radiation, Measurement, Bolometers, Airborne, Wind, Boundary layer.

Contents:
Micrometeorological installations on Lake Mendota
Spatially continuous measurements of temperature profiles through an air-water interface
Preliminary report on an optical method for low-level lapse rate determination
An airborne measuring system for micrometeorological studies
Technique and results of surface-temperature determinations with an airborne bolometer
Climatology of atmospheric boundary-layer parameters and energy dissipation, derived from Gregg's Aerological Survey of the U. S.
Equiangular wind and current spirals
Case studies of dynamical interactions at an air-water interface
Notes on theoretical models of profile structure in the diabatic surface layer

AD-296 161 Div. 2
(TISTW/JEA) OTS price $5.60

Woods Hole Oceanographic Institution, Mass.
REPORT ON ATLANTIS CRUISES #280-281, JUNE-JULY 1962,
by Richard M. Pratt and Stephen L. Thompson.
Dec 62, 16p. illus. tables, 4 refs. (Reference no. 62-40)
(Contract Nonr-136700, Proj. NR 261-102)
Unclassified report

DESCRIPTORS: *Bathythermograph data, *Ocean bottom sampling, *Photography, *Hydrographic sonar, Sedimentary rocks, Oceanology, Ocean bottom topography, Oceanographic data, Oceanographic vessels, Petrology, Echo ranging, Underwater photography, Underwater cameras, Underwater equipment, Records, Marine biology, Mapping, Photographs, Oceans, Terrain, Ocean bottom.

Research on ATLANTIS Cruises 280 and 281 to the New England Seamount Chain are reported. A continuous bathymetric survey was run on both cruises, with profiles across several seamounts. A series of dredge and camera stations were made. Also included are photographs representative of each camera lowering and photographs of dredged material. (Author)

AD-296 167 Div. 2
(TISTP/JW) OTS price $4.60

California U., Los Angeles.
FURTHER STUDIES OF NUMERICAL ERRORS IN THE INTEGRATION OF BAROTROPIC FLOW ON A SPHERICAL GRID.
Final rept., 1 July 60-31 Dec 62,
by W. Lawrence Gates and Christopher A. Riegel.
31 Dec 62, 39p. incl. illus. 1 ref.
(Contract AF 19(604)6149, Proj. 8628)
(AFCRL 62-1073) Unclassified report

DESCRIPTORS: *Meteorological parameters, *Numerical analysis, Weather forecasting, Fluid flow, Analysis, Errors.

Using a spherical finite-difference grid system covering the hemisphere, numerical solutions of the non-divergent barotropic vorticity equation have been obtained for periods up to 10 days by relaxation methods. In the case of analytic initial conditions, the solutions are sensitive to abrupt changes of the longitudinal mesh size in the regions of appreciable amplitude of the streamfunction tendency. A doubling of the longitudinal mesh size from 5 to 10 deg at 45 deg N produces a progressive tearing or shearing in the streamfunction which is quite noticeable at 10 days. When the grid variation is removed to 70 degrees N, however, the solutions at 10 days are free of this defect, although exhibiting the expected phase lag relative to the analytic solution. When applied to hemispherical barotropic prediction with actual 500 mb data, this spherical grid scheme appears to perform as satisfactorily as do conventional (rectangular) grid formulations. (Author)

Division 2 - ASTRONOMY, GEOPHYSICS AND GEOGRAPHY

AD-296 168 Div. 2, 15
(TISTP/JW) OTS price $2.60

California U., Los Angeles.
THE EFFECT OF FINITE DIFFERENCES ON THE GROWTH RATES OF UNSTABLE WAVES IN A SIMPLE BAROCLINIC MODEL,
by Christopher A. Riegel. 1 Oct 62, 23p. incl. illus. 3 refs. (Scientific rept. no. 7)
(Contract AF 19(604)6149, Proj. 8628)
(AFCRL 62-1078) Unclassified report

DESCRIPTORS: *Meteorological parameters, *Microbarometric waves, Difference equations, Nonlinear differential equations, Analysis, Measurement.

The distortion of the growth rates of unstable baroclinic waves is investigated using implicit finite differences to replace the linearized governing equations of a two-parameter model. A variety of space and time mesh sizes are used, together with three values of static stability parameters. On the whole, the introduction of finite differences appears to cause only a slight distortion of the growth rates over the major portion of the unstable spectrum, the long waves being less affected than the short waves. Effects due to delta t are particularly minor. The finite-difference growth rates depend very slightly on the zonal wind U, in contrast to the continuous case where no such dependence is found. (Author)

AD-296 231 Div. 2, 8
(TISTP/MB) OTS price $5.60

Rensselaer Polytechnic Inst., Troy, N. Y.
EFFECTS OF THE ATMOSPHERE ON RADIO ASTRONOMICAL SIGNALS.
Final rept.,
by Robert Fleischer, Masakazu Oshima and others. 30 Apr 62, 55p. incl. illus. tables, 20 refs.
(Contract AF 19(604)8055, Proj. 5561)
(AFCRL 62-311) Unclassified report

DESCRIPTORS: *Thunderstorms *Radio waves, Atmosphere, Radio astronomy, Antennas, Radiofrequency pulses, Electrical discharges, Electrical corona, Meteorological parameters, Meteorological phenomena, Atmospheric electricity, Atmospheric refraction, Radiometers, Meteorological radar.

Observations of the apparent temperature of thunderstorm cells were made at a number of frequencies, from 10 cps to 3000 Mc during the month of July 1961. The storm July 21 is analyzed in detail. The observations are summarized. A theory is developed to predict the antenna temperature which may be expected from a storm cell. Briefly, the optical depth of the storm cell and the surrounding atmosphere is found to be low. Emission of radiation apart from sudden lightning discharges is attributed to corona discharge from charged particles within the storm cell. The discharges are assumed to be similar in character to the point-to-plate discharges studied in the laboratory, which are characterized by pulses. Calculations of the observed antenna temperature at several frequencies are given as well as limits on the parameters of the discharge model to fit the observations, and a discussion of the extent of agreement of theory and observation with some suggestions for further detail in investigation. (Author)

AD-296 235 Div. 2, 9
(TISTP/JW) OTS price $3.60

Woods Hole Oceanographic Institution, Mass.
CURRENT MEASUREMENTS FROM MOORED BUOYS.
by W. S. Richardson, P. B. Stimson, and C. H. Wilkins. Jan 63, 18p. illus. 3 refs. (Ref. no. 63-1)
(Contract Nonr-335100, Proj. NR 083-501)
Unclassified report

DESCRIPTORS: *Ocean currents, *Buoys, Velocity, Turbulence, Gulf Stream, Instrumentation, Measurement, Mooring.

AD-296 241 Div. 2
(TISTP/GRW) OTS price $1.10

Scripps Institution of Oceanography, U. of Calif., La Jolla.
(No title).
Final rept., Nov 59-Oct 60.
Oct 60, 4p.
(Contract Nonr-221606, Proj. NR 307-253)
Unclassified report

DESCRIPTORS: *Oceanographic data, Hydrographic surveying, Salinity, Temperature, Periodic variations, Oceanographic vessels, Tides, Polar regions.

AD-296 251 Div. 2
(TISTM/ODN) OTS price $1.60

Pennsylvania State U. Mineral Industries Experiment Station, University Park.
STEPWISE REVERSAL TRANSFORMATIONS OF COESITE AND STISHOVITE,
by Frank Dachille, Robert J. Zeto, and Rustum Roy. 30 Dec 62, 13p. incl. illus. tables, 10 refs. (Technical rept. no. 9)
(Contract Nonr-656(20)
Unclassified report

DESCRIPTORS: *Minerals, Silicon compounds, Oxides, Heat treatment, Quartz, Phase studies, X-ray photography, Spectroscopy, Transformations.

Very marked differences in the metastable persistence for coesite and stishovite have been demonstrated, the former possibly persisting indefinitely below 1000 C at 1 atm. 'dry', the latter decomposing in minutes above 500-600 C to a short range order (SRO) phase. Quartz has been grown metastably well above its stability field from both coesite, and stishovite, possibly via an SRO phase. The absence of stishovite in meteor-impact craters cannot be taken as possible evidence that it was not formed. If it has 'reversed' in a normal natural environment the product would almost certainly be an SRO phase or derivative. (Author)

AD-296 253 Div. 2
(TISTP/JW) OTS price $1.60

Minnesota U., Minneapolis.
SEISMIC CRUSTAL STUDY IN THE CHUKCHI SEA,
by D. D'Andrea, E. Thiel, and N. Ostenso.
Dec 62, 7p. incl. illus. tables (Technical rept. no. 1)
(Contract Nonr-71044)
Unclassified report

DESCRIPTORS: *Seismic waves, Seismographs, Instrumentation, Earth, Surface properties, Ice islands.

During the period from June 22 to September 12, 1961, a seismic refraction study of the emerged and submerged coastal plain of northern Alaska was started in an attempt to determine the structure of the earth's crust in that area. This seismic study is part of a broad program of gravity, magnetic, and seismic investigations of the Arctic Ocean basin. Thirty shots were successfully recorded on a seismograph located at Point Barrow. Sixteen of these shots were fired in the Chukchi Sea and 14 on land. Eleven shots were fired from the U.S.S. Staten Island for a reversed profile extending 320 Km. northwest of Point Barrow. Using a weasel or small motor boat for transportation, 14 shots for two reversed profiles were set off within 30 Km. at the recording seismograph. One shot was fired from the U.S.S. Burton Island 16 Km. to the north. The offshore end of the long refraction profile at sea was recorded on ice island Arlis II by personnel from the Lamont Geological Observatory. A series of shots were attempted along a line between Point Barrow and Umiat, 250 Km. to the southwest using pontoon equipped Cesna 180 aircraft. These shots were not successfully recorded because of the difficulty in burying shots deep enough in the tundra or shallow lakes to provide sufficient energy coupling from the explosives into the earth. (Author)

AD-296 373 Div. 2
(TISTW/PCR) OTS price $10.10

Defense Research Lab., U. of Texas, Austin.
GEOPHYSICAL INTERPRETATIONS OF POWER SPECTRAL ANALYSIS OF LOW FREQUENCY FLUCTUATIONS IN THE MAGNETOTELLURIC FIELD.
Doctoral thesis,
by Alexander A. J. Hoffman. Jan 62, 117p. incl. illus. tables, 27 refs. (APL Bumblebee series rept. no. 310)
(Contract NOrd-16498)
Unclassified report

DESCRIPTORS: *Electric currents, *Magnetic fields, *Terrestrial magnetism, Spectrum analyzers, Low frequency, Geophysics, Recording systems, Geology, Data processing systems, Statistical analysis, Bibliographies, Earth, Measurement.

A description of the recording equipment and geological configuration at the location of three Soviet geomagnetic observatories which participated in the IGY is followed by a discussion of the sample data processing procedures for power spectral analysis. Theory and applications of time-domain numerical filter operators are presented. Power spectra of the horizontal components of the magnetic field and telluric field are computed for ten-hour periods. Spectral analyses of the East-West telluric field component were carried out for simultaneous recordings of several hours duration made at three Soviet stations: Tbilisi, Lvov, and Ashkhabad. The coherency between orthogonal components of the telluric and magnetic fields is computed for the data from Tbilisi. Magnetic power spectra from USSR, Canada, Texas, and Massachusetts are plotted on a common graph to show the frequency dependence over the range 0.03 to 400 cpks. It is found that both components of the telluric field yield a value of 6 ohm meters for the electrical resistivity of the earth. It is suggested that this value applies to depths from 70 to 700 kilometers. (Author)

AD-296 402 Div. 2
(TISTP/JW) OTS price $1.60

Oregon State U., Corvallis.
SURFACE TEMPERATURE AND SALINITY OBSERVATIONS AT SHORE STATIONS ON THE OREGON COAST FOR 1961,
by Malcolm Oliphant, Bruce Wyatt and Norman F. Kujala. Sep 62, 15p. incl. illus. tables, 3 refs. (Data rept. no. 8; Ref. no. 62-11)
(Contract Nonr-128602, Proj. NR 083-102)
Unclassified report

DESCRIPTORS: *Surface temperatures, *Oceanology, Tables, Measurement, Sampling, Oceans, Salinity.

AD-296 408 Div. 2
(TISTW/JEA) OTS price $2.60

Stanford Research Inst., Menlo Park, Calif.
OBJECTIVE AND DYNAMICAL STUDIES OF TROPICAL WEATHER PHENOMENA.
Quarterly progress rept. no. 2, 1 Sep-30 Nov 62,
by R. M. Endlich and R. L. Mancuso. 30 Nov 62, 14p. incl. illus. tables, 4 refs.
(Contract DA 36-039-sc-89092, Proj. 3A99-27-025-09-00)
Unclassified report

DESCRIPTORS: *Weather forecasting, *Surface area, *Meteorological phenomena, Vertical gust recorders, Vortices, Deformation, Height finding, Temperature, Humidity, Weather stations, Wind, Wind direction indicators, Computers, High altitude, Gusts, Energy, Tropical regions, Analysis.

IBM card data for the Caribbean was processed in the form of layer averages of wind components, height, temperature, and relative humidity. The averaged quantities were mapped by the computer, and subjective analyses were partially completed. A computer program for obtaining a streamfunction was comp'ted. The streamfunction is made to fit observed winds, while observed heights are used as an initial guess. No boundary conditions are required. A preliminary analysis indicates that the results are quite satisfactory. Analyses of computer values of vorticity, divergence, and vertical motion were also begun, and average magnitudes of these quantities were determined. (Author)

AD-296 431 Div. 2
(TISTP/GRW) OTS price $1.60

Lamont Geological Observatory, Palisades, N. Y.
GEOMAGNETIC OBSERVATIONS OF FLETCHER'S ICE ISLAND (T-3), ARCTIC OCEAN,
by James C. G. Walker. Nov 62, 5p. illus. 9 refs. (Scientific rept. no. 5)
(Contract AF 19(604)7442)
(AFCRL 62-1088) Unclassified report

DESCRIPTORS: *Terrestrial magnetism, *Magnetic storms, Ice islands, Magnetometers, Periodic variations, Intensity.

AD-296 442 Div. 2
(TISTP/GRW) OTS price $7.10

Acoustics and Seismics Lab., U. of Michigan, Ann Arbor.
SEISMOLOGICAL EVIDENCE PERTAINING TO THE STRUCTURE OF THE EARTH'S UPPER MANTLE,
VESIAC State-of-the-Art rept.,
by Otto Nuttli. Jan 63, 70p. incl. illus. tables, 93 refs. (Rept. no. 4410-40-X)
(Contract SD-78)
Unclassified report

DESCRIPTORS: *Seismic waves, *Rock (Geology), Mechanical waves, Earth, Seismographs, Standards, Structural properties, Velocity, Wave transmission.

variation of the velocity of P and S waves with depth in the upper mantle of the earth, and the effect of this variation upon the recorded earth motion at distances less than 3000 km from the source are studied. Body-wave and surface-wave study results of many authorities are examined, and the following conclusions presented: (1) there are significant regional variations of velocity in the upper mantle, (2) there is no pronounced shadow zone for P waves resulting from a low-velocity channel in the upper mantle, except in tectonically active regions such as California-Nevada, Japan, Andes, etc., and (3) there is a significant, world-wide low-velocity channel for S waves. A tabulated summary of upper mantle structure according to geographical region is presented. A summary, recommended problems for future research, and a statement of instrumentation requirements for further study of the upper mantle complete the presentation. (Author)

AD-296 467 Div. 2
(TISTP/JW) OTS price $1.60

Hydraulic Engineering Lab., U. of Calif., Berkeley.
SAND MOVEMENT ON COASTAL DUNES.
Rept. for 28 Jan-1 Feb 63,
by J. W. Johnson. 1 Feb 63, 18p. incl. illus. 9 refs. (Technical rept. no. HEL-2-3)
(Contract DA 49-055-civ-eng-63-4)
Unclassified report

DESCRIPTORS: *Sand, *Beaches, Wind tunnels, Measurement, Climatology, Motion, Velocity.

AD-296 492 Div. 2, 5, 6, 8, 22, 25
(TISTE/OHD) OTS price $2.60

Lincoln Lab., Mass. Inst. of Tech., Lexington.
DIVISION 3. RADIO PHYSICS.
Quarterly progress rept., 1 Oct-31 Dec 62.
15 Jan 63, 13p.
(Contract AF 19(628)500)
(AFESD TDR 63-18) Unclassified report

DESCRIPTORS: *Radio astronomy, *Detection, *Antennas, *Radio communication systems, Propagation, Solar radiation, Nuclear explosions, Plasma physics, Laboratories, L band, Ultrahigh frequency, Venus, Extraterrestrial radio waves, Radio astronomy, Communication satellites (Active).

AD-296 551 Div. 2
(TISTW/PCR) OTS price $1.60

National Oceanographic Data Center, Washington, D. C.
QUARTERLY LIST OF FULLY PROCESSED OCEANOGRAPHIC CRUISES.
1 Jan 63, 12p. refs.
Unclassified report

DESCRIPTORS: *Oceanographic data, *Bibliographies, Hydrology, Hydrographic surveying, Plankton, Fishes, Ice Islands.

AD-296 567 Div. 2
(TISTW/JEA) OTS price $10.10

Bendix Systems Div., Bendix Corp., Ann Arbor, Mich.
JUNGLE CANOPY PENETRATION. VOLUME I. DIFFUSION MEASUREMENTS.
Final rept., Aug 61-Jan 63.
Jan 63, 122p. incl. illus. tables, 5 refs.
(Rept. no. BSC 36174, vol. 1)
(Contract DA 42-007-530)
Unclassified report

DESCRIPTORS: *Diffusion, *Particles, *Tropical regions, *Aerosols, *Jungles, *Trees, Experimental data, Zinc compounds, Cadmium compounds, Sulfides, Sensitivity, Wind, Dosage, Tracer studies, Photographs, Gravity, Statistical data, Growth, Height finding, Surface area, Test facilities, Meteorology, Condensation, Aircraft, Measurement, Fluorescence, Ventilation, Distribution, Penetration.

An investigation was made of the ventilation processes of a tropical rainforest. A convenient and proven technique for such an investigation involves the release of an aerosol tracer above the forest. The ventilation of the forest is then measured in terms of the extent to which the tracer penetrates the canopy, and moves horizontally within the forest. Penetration of the canopy and lateral movement within the forest by an aerosol are influenced both by the forest and by meteorology. Since the forest is in a sense a parameter, a complete description of the vegetation is essential to extrapolating the results to other sites. The importance of meteorology in diffusion clearly requires the collection of meteorological data. Zinc cadmium sulfide, which fluoresces under ultraviolet light was selected as the tracer. (Author)

AD-296 572 Div. 2
(TISTW/JEA) OTS price $9.60

Bendix Systems Div., Bendix Corp., Ann Arbor, Mich.
JUNGLE CANOPY PENETRATION. VOLUME II. VEGETATION AND METEOROLOGICAL STUDIES.
Final rept., Aug 61-Jan 63.
Jan 63, 1v. incl. illus. tables, refs. (Rept. no. BSC 36175, vol. 2)
(Contract DA 42-007-530)
Unclassified report

DESCRIPTORS: *Tropical regions, *Forestry, *Plants, *Meteorological parameters, *Trees, Temperature, Humidity, Rainfall, Swamps, Ecology, Photographs, Surface area, Jungles, Meteorology, Test facilities, Geography, Wind, Penetration, Height finding, Climatology, Growth, Distribution, Ventilation.

AD-296 765 Div. 2
(TISTP/JW) OTS price $10.50

Bendix Systems Div., Bendix Corp., Ann Arbor, Mich.
JUNGLE CANOPY PENETRATION. VOLUME III. LOGISTICS, INSTRUMENTATION, AND DATA PROCESSING.
Final rept., Aug 61-Jan 63.
Jan 63, 136p. incl. illus. tables, 1 ref.
(Rept. no. BSC 36176, vol. 3)
(Contract DA 42-007-530)
Unclassified report

DESCRIPTORS: *Climatology, Data, Ventilation, Data processing systems, Jungles.

The Jungle Canopy Penetration study had as its primary objective, the investigation of the ventilation processes of rain forest. A standard aerosol tracer technique was used. This volume presents a detailed account of the many preliminary activities and support functions that were an essential part of the data acquisition and their eventual interpretation. (Author)

AD-296 801 Div. 2
(TISTP/JW) OTS price $6.60

Massachusetts Inst. of Tech., Cambridge.
RESEARCH ON THE PHYSICAL PROPERTIES OF MARINE SOILS.
Rept. for Aug 61-July 62.
Nov 62, 21p. illus. tables, 9 refs. (Research rept. no. R62-42)
(Contract Nonr-184129)
Unclassified report

DESCRIPTORS: *Soils, *X-ray, Radiation measurement systems, X ray diffraction analysis, Moisture, Clay, Measurement.

This report describes in detail a method for quantitatively measuring fabric of clay. Wet clay is impregnated with a polyalcohol which permits grinding a very flat surface (without disrupting the original fabric) for quantitative X-ray measurement. In the specific procedure discussed, a Norelco diffractometer equipped with a pole figure device and a Geiger detector was employed to measure by reflection the diffracted intensity of selected peaks (002 and 020) on kaolinite clay. The amplitude of the 002 peak to the amplitude of the 020 peak is called the peak ratio which quantitatively expresses particle orientation on a given surface. Heterogeneity of particle orientation on a surface is expressed in terms of the observed standard deviation relative to the standard deviation expected from counting statistics for peaks of the appropriate amplitude. (Author)

AD-296 827 Div. 2
(TISTP/GRW) OTS price $8.60

Royal Inst. of Tech. (Sweden).
ON AN EXPLICIT SOLUTION OF THE GRAVIMETRIC BOUNDARY VALUE PROBLEM FOR AN ELLIPSOIDAL SURFACE OF REFERENCE.
Final rept.
30 Nov 62, 1v. incl. illus. tables.
(Contract DA 91-591-EUC-2033)
Unclassified report

DESCRIPTORS: *Geodesics, Ellipsoids, Gravity, Functions, Mathematical analysis.

AD-296 851 Div. 2
(TISTP/JW) OTS price $14.00

Boeing Co., Renton, Wash.
TEMPERATURE FOR NORTH AMERICAN AIR ROUTES AT HEIGHTS OF 5000, 10,000, 15,000, 20,000, 30,000, 40,000 AND 53,000 FEET WITH SUPPLEMENTARY SURFACE TEMPERATURES,
by Raymond M. Wells. Aug 62, 1v. incl. illus. tables (Reviews in Geophysics no. 6; Document no. D6-7176)
Unclassified report

DESCRIPTORS: *Temperature, *Global communication systems, High altitude, Computers, Airports, Measurement, Tables, Mapping.

Seasonal and annual great circle route temperatures in degrees Celsius are computed for 50-, 75-, and 85-per cent reliabilities of occurrence, i.e. temperatures which are not expected to be exceeded 50, 75 and 85 per cent of the time respectively. The temperatures and their standard deviations are computed over some 2000 selected air routes at the 10,000-, 20,000-, 30,000-, 40,000- and 53,000-foot levels and in addition at the 5000-, 10,000- and 15,000-foot levels for routes < 400 nautical miles in length. The great circle distance between termini is also tabulated. A 7090 was used to compute the route temperatures. Input data for the program consist, for each level, of a grid composed of the mean temperature and its standard deviation at the intersection of each 5 degrees of latitude with each 10 degrees of longitude between 60 degrees S and 60 degrees N and at the intersection of each 5 degrees of latitude with each 20 degrees of longitude south and north of 60 degrees S and 60 degrees N respectively. Supplementary airport surface temperatures are tabulated by month, quarter, half year and year for the 0, 50, 75, 85, 95 and 100 per cent probability of not being exceeded. Lackey's method, adapted for the 7090, was used to compute the surface temperatures. (Author)

AD-296 938 Div. 2
(TISTP/JW) OTS price $13.50

United ElectroDynamics, Pasadena, Calif.
FIELD STUDY OF VARIATION IN CHARACTERISTICS OF SEISMIC NOISE AND SIGNALS WITH GEOLOGIC AND GEOGRAPHIC ENVIRONMENT.
Final rept., vol. 1,
by J. N. Griffin. 15 Jan 63, 1v. incl. illus. tables, refs. (Rept. no. VT/078-28, vol. 1)
(Contract AF 33(600)42048, Proj. VT/078)
Unclassified report

DESCRIPTORS: *Seismic waves, *Geography, Measurement, Signal-to-noise ratio, Wind, Geology, Noise, Climatology.

A two-year study was conducted to determine relationships among seismic noise, teleseismic signals, and various geologic and geographic recording environments. Variation in seismic noise and signal with geologic-geographic recording environment was measured in California, the Pacific Northwest and in the Appalachian Mountains - Atlantic coastal plain areas, between March 1961 and September 1962. One centrally located station remained fixed, recording simultaneously with another roving station which consecutively recorded in locations of varying geologic and topographic environment. At both stations signal and noise was recorded on film and magnetic tape by tripartite arrays of 4 short-period and 1 long-period vertical seismometers. Noise data gathered was processed by power spectrum analysis to define the noise amplitude spectrum at each recording station. Some cross-spectrum analysis was done on Pacific Northwest data in order to study noise source directions, coherency and phase velocities. Variations in noise and teleseismic signals were then correlated with variations in geologic-geographic recording environment, and conclusions were drawn. (Author)

AD-296 939 Div. 2
(TISTP/JW) OTS price $18.00

United Electrodynamics, Pasadena, Calif.
FIELD STUDY OF VARIATION IN CHARACTERISTICS OF SEISMIC NOISE AND SIGNALS WITH GEOLOGIC AND GEOGRAPHIC ENVIRONMENT.
Final rept., vol. 2,
by J. N. Griffin. 15 Jan 63, 1v. incl. illus. tables, 66 refs. (Rept. no. VT/078-28, vol. 2)
(Contract AF 33(600)42048, Proj. VT/078)
Unclassified report

DESCRIPTORS: *Seismic waves, *Geography, Measurement, Wind, Geology, Tables, Noise, Climatology.

AD-296 980 Div. 2, 25
(TISTP/WH) OTS price $4.60

Aerospace Information Div., Washington, D. C.
SOVIET RADIO TELESCOPES. SELECTED ABSTRACTS OF SOVIET LITERATURE.
6 Feb 63, 41p. incl. illus. tables, refs.
(AID rept. no. P-63-21)
Unclassified report

DESCRIPTORS: *Radio astronomy, *Telescopes, Abstracts, Radio signals.

3. CHEMICAL WARFARE EQUIPMENT AND MATERIALS

AD-296 849 Div. 3, 22
(TISTP/JW) OTS price $2.60

Booz-Allen Applied Research, Inc., Chicago, Ill.
APPLIED CW MATHEMATICAL AND STATISTICAL RESEARCH.
Quarterly progress rept. no. 2, 1 Oct-31 Dec 62, Jan 63, 20p. incl. table (Rept. no. 803-1-R2)
(Contract DA 18-108-cml-7174)
Unclassified report

DESCRIPTORS: *Chemical warfare, *Statistical distributions, Statistical functions, Fragmentation, Data, Tables, Meteorology, Research program administration, Sampling.

4. CHEMISTRY

AD-296 037 Div. 4
(TISTM/SJR) OTS price $1.60

Tulane U., New Orleans, La.
EXPERIMENTAL STUDIES OF THE REACTIONS OF N_2O_5 WITH METAL ACID ANHYDRIDES AND BF_3.
Final rept., 1 Apr 61-1 Apr 62,
by Arlo D. Harris and John C. Trebellas.
26 Apr 62, 14p. illus.
(Grant no. DA-CML-18-108-61-G-16)
Unclassified report

DESCRIPTORS: *Inorganic compounds, Chromyl radicals, Vanadium compounds, Nitrates, Nitrogen compounds, Oxides, Oxychlorides, Titanium compounds, Complex compounds, Boron compounds, Fluorides, Infrared spectroscopy, Molybdenum compounds, Synthesis.

AD-296 150 Div. 4, 16
(TISTM/SJR) OTS price $9.10

Marquette U., Milwaukee, Wis.
AMPEROMETRIC TITRATIONS AND POLAROGRAPHIC STUDIES OF ANTIRADIATION DRUGS.
Annual progress rept., Feb 62-Jan 63,
by Walter Stricks. 5 Feb 63, 70p. incl. illus. tables, 2 refs.
(Contract DA 49-193-MD-2146)
Unclassified report

DESCRIPTORS: *Reaction kinetics, *Chemical analysis, *Volumetric analysis, *Polarographic analysis, Mercury compounds, Silver compounds, Platinum, Electrodes, Chlorides, Nitrates, Sulfides, Selenium compounds, Catalysis, Reduction, Cobalt compounds, Ammonium compounds, Solutions, Glutathione, Pharmacology, Mercury, Radioprotective agents, Sulfur compounds, Potentiometers.

The work deals with amperometric and polarographic studies of antiradiation drugs as follows: (1) amperometric mercurimetric and argentimetric titrations of mercaptoethylguanidine, mercaptopropylguanidine and mercaptoethylamine at the rotated platinum electrode as indicator electrode; (2) the polarography of 2-aminoethane thiosulfuric acid, and 2-aminoethane-selenosulfuric acid; and (3) catalytic effects which are observed in ammoniacal cobalt solutions in the presence of minute quantities of sulfhydryl or disulfide containing compounds. These catalytic effects can be helpful for a study of the interaction of sulfhydryl compounds with serum proteins before and after irradiation. It was with this aim in mind that these studies were initiated. (Author)

AD-296 212 Div. 4
(TISTM/EJH) OTS price $2.60

Washington U., Seattle.
COLLISIONAL TRANSITION PROBABILITIES FOR VIBRATIONAL DEACTIVATION OF CHEMICALLY ACTIVATED SEC-BUTYL RADICALS. DIATOMIC AND POLYATOMIC MOLECULES,
by G. H. Kohlmaier and B. S. Rabinovitch. 1962, 12p. illus. tables, refs.
Unclassified report

DESCRIPTORS: *Organic compounds, *Free radicals, *Gases, Excitation, Kinetic theory, Energy, Vibration, Theory, Thermochemistry, Electron transitions, Hydrogen, Deuterium, Nitrogen, Sulfur compounds, Fluorides, Chlorides, Carbon dioxide, Halogens, Alkenes.

The study of collisional transitional probabilities for the de-excitation by inert gases of chemically activated sec-butyl radicals, excited to internal energies in excess of 40 kcal/mole, was extended to H_2, D_2, N_2, CO_2, CH_4, CD_3F, CH_3Cl and SF_6. The diatomic gases display behavior similar to the rare gases, and on a preferred exponential model of collisional transition probabilities the average amount of energy transferred per collision is 1.3 kcal/mole. On a step-ladder model the corresponding amount is delta E = 2.5 kcal/mole. From higher pressure data, the efficiency for CD_3F, CH_3Cl and SF_6 is deduced to be comparable with that for butene and on a preferred step-ladder model, delta E > 9 kcal. For CO_2 and CH_4 the behavior is intermediate. The possible importance of the role of internal rotation of butyl in facilitating energy transfer is noted; some uncertainty exists concerning the role of over-all rotations and vibrational modes of the deactivator in the relaxation process. (Author)

AD-296 213 Div. 4
(TISTM/EJH) OTS price $2.60

Washington U., Seattle.
LARGE STATISTICAL SECONDARY ISOTOPE EFFECTS IN NON-EQUILIBRIUM REACTION SYSTEMS UNIMOLECULAR

DECOMPOSITION OF CHEMICALLY ACTIVATED ETHYL-D1 AND ETHYL-D3 RADICALS,
by J. H. Current and B. S. Rabinovitch. 1962, 15p. tables, refs.
Unclassified report

DESCRIPTORS: *Decomposition, *Deuterated compounds, *Free radicals, *Organic compounds, *Alkenes, Isotopes, Chemical reactions, Quantum mechanics, Atomic energy levels, Thermochemistry, Reaction kinetics.

Hydrogen atom rupture from chemically activated ethyl-d1 radicals was studied and is compared with a similar reaction of ethyl-d3 radicals. The activation reactions were D atom addition to ethylene or to trans-ethylene-d2. A very large normal statistical intermolecular secondary kinetic isotope effect of > 1.5 per D atom substituent was found. The experimental results are in concordance with the theory and conform to the formulation of these effects previously given. The calculated effect is 1.6. These magnitudes per D atom are considerably enhanced over those obtained for butyl radicals. (Author)

AD-296 273 Div. 4, 25
(TISTM/EJH) OTS price $1.60

Arizona U., Tucson.
ELECTRICAL AND MAGNETIC PROPERTIES OF ORGANIC SOLIDS.
Final rept.,
by Gordon Tollin. 15 Nov 62, 7p.
(Contract AF 19(604)8475, Proj. 4769)
(AFCRL 62-1116) Unclassified report

DESCRIPTORS: *Vitamin B complex, *Complex compounds, *Organic compounds, *Nitrogen heterocyclics, Electrons, Spin, Resonance, Spectroscopy, Nuclear spins, Paramagnetic resonance, Magnetic properties, Mechanical properties, Electrical properties, Crystals, Single crystals, Solutions, Benzene.

Some of the optical, electrical, and magnetic properties of molecular complexes (in solution and in the solid state) of riboflavin and its derivatives (both alloxazine and isoalloxazine ring systems) with aromatic phenols were investigated. In addition, through the use of electron spin resonance spectroscopy, the distribution of unpaired spin density in the free radical semiquinones of riboflavin derivatives was determined. (Author)

AD-296 533 Div. 4, 14, 25
(TISTM/SJR) OTS price $4.60

Electro-Optical Systems, Inc., Pasadena, Calif.
RESEARCH AND INVESTIGATION OF MATERIALS FOR LASER APPLICATIONS.
Interim engineering rept., 1 Nov 62-31 Jan 63,
by K. A. Yamakawa, J. Burns and others.
15 Feb 63, 38p. incl. illus. tables, refs. (EOS rept. no. 3110-Q-3)
(Contract AF 33(657)8918)
Unclassified report

DESCRIPTORS: *Lasers, *Metalorganic compounds, *Rare earth elements, *Chelates, Neodymium compounds, Erbium compounds, Praseodymium compounds, Samarium compounds, Terbium compounds, Fluorides, Fluorescence, Spectroscopy, Embedding substances, Acrylic resins, Epoxy plastics, Glass, Crystal lattice defects, Impurities, Materials, Synthesis.

The work reported for this period consists of the following: The synthesis and purification of selected beta-diketone derived chelates using different radicals, the results of fluorescence and decay time measurements on some of these compounds, the effect of halogenation and purity of sample on the above measurements, and the development of new glass hosts and the successful lasering of a sample of this glass doped with neodymium. (Author)

AD-296 544 Div. 4
(TISTM/EJH) OTS price $19.75

Army Engineer Research and Development Labs., Fort Belvoir, Va.
PROCEEDINGS OF THE TENTH BASIC RESEARCH GROUP CONTRACTORS' CONFERENCE AND SYMPOSIUM, 24-26 OCTOBER 1961, U.S. ARMY ENGINEER RESEARCH AND DEVELOPMENT LABORATORIES, FORT BELVOIR, VIRGINIA,
by Hyman Rosenwasser. 1961, 320p. incl. illus. tables.
(Proj. 8X99-25-001-40A) Unclassified report

DESCRIPTORS: *Nitrogen compounds, Symposia, Conferences, Alkali metal compounds, Alkaline earth compounds, Crystal structure, Single crystals, Paramagnetic resonance, Rare earth compounds, Optical properties, Thermodynamics, Nuclear spin, Spectroscopy, Synthesis (Chemistry), Chemical reactions.

Contents: Thermal profile of solutions; Order-disorder phenomena in thallium azide; X-ray radiation damage of alkali azides; Inorganic ozonides; Intramolecular changes initiated by electrophilic attack on alkyl azides; Bent state nature of the azide group; Photochemical decomposition of barium azide; Applicability of Hahn's emanation method for decomposition studies of inorganic azides; Radiation-induced defects in sodium azide; Electron spin resonance experiments on alpha lead azide; Paramagnetic resonance in potassium azide irradiated at 77 K; Exo-electron emission and related electron-emissions from solids; Irradiation produced paramagnetic defect centers in single crystal potassium azide; Preparation and properties of alkali azides; IR spectra of the azide ion in alkali halide lattices; Photoconductivity, electron micrographs and mechanism of thermal decomposition of lead azide; Thermal decomposition of molten KN_3 in the presence of metals and metal oxides; Thermal decomposition of lead azide; Optical and electrical properties of alkali metal azides; Statistical theory of initiation; Synthesis and properties of tetravalent lead azides; Basic rare earth azides.

AD-296 555 Div. 4
(TISTM/EJH) OTS price $1.10

Rutgers U. School of Chemistry, New Brunswick, N. J.
POLYSOAPS.
Final rept.,
by Ulrich P. Strauss. 31 Jan 63, 5p. refs.
(Contract Nonr-40405, Proj. NR 051-308)
Unclassified report

DESCRIPTORS: *Soaps, *Electrolytes, *Polymers, Chemical reactions, Solutions, Viscosity, Solvent action, Solubility, Surface properties, Scattering, Light, Electrical properties, Hydrocarbons, Bromides.

AD-296 566 Div. 4, 25
(TISTM/EJH) OTS price $11.00

New York U., N. Y.
TRANSPORT PROCESSES IN FUSED SALTS, PART I.
Technical progress rept.,

by Benson R. Sundheim. 1 Dec 62, 1v. incl. illus. tables, refs.
(Contract Nonr-28537)
Unclassified report

DESCRIPTORS: *Salts, *Electrolytes, *Hydrodynamics, Theory, Reaction kinetics, Mathematical analysis, Thermoelectricity, Electrical conductance, Diffusion, Viscosity, Thermodynamics, Test methods, Eutectics, Liquids, Electrolytic cells, Tables, Transport properties.

AD-296 573 Div. 4
(TISTM/EJH) OTS price $1.10

University Coll., Dublin (Eire).
REDUCTION BY ORGANOMETALLIC COMPLEXES,
by David A. Brown, J. P. Hargaden, and H. Sloan. 1962, 2p. 3 refs. (Technical rept. no. 4)
(Contract N62558-2381, Proj. NR 051-417)
Unclassified report

DESCRIPTORS: *Metalorganic compounds, *Complex compounds, *Reduction (Chemistry), *Organic compounds, Chemical reactions, Chromium compounds, Benzene (Monosub), Azo radicals, Amines, Carbonyl (Polyusage), Hydrochloric acid, Benzene (Polysubstituted), Benzene (Ind).

Solutions of azobenzene (.01 M) and tricarbonylarenechromiums (.01 M), $RC_6H_5(CO)_3$, in dulute ethanolic hydrochloric acid (.01 M) under N give fair yields (up to 30%) of benzidine dihydrochloride, identified by analysis and I.R. spectrum. The reaction occurs for the substituent range R=Me,CL,H,NH2,NHMe and NMe_2 and is facilitated by electron repelling groups; this is consistent with protonation at the chromium atom being assisted by charge transfer. No reduction is observed in the absence of acid so some type of protonation seems essential. More dilute solutions (.0001 M) of the complexes undergo fairly rapid decomposition in ethanolic hydrochloric acid under N with the evolution of CO and formation of free arene. Spectrophotometric studies of tricarbonylanilinechromium show an immediate fall in intensity of the 3150 angstrom band corresponding to protonation at the N atom followed by a further decrease due to decomposition; extrapolation gives a pKa value to 1.26. Results support the view that reduction by organometallic complexes is related to protonation at the metal atom. (Author)

AD-296 574 Div. 4
(TISTM/EJH) OTS price $1.10

University Coll., Dublin (Eire).
REDUCTION BY METAL CARBONYLS,
by David A. Brown, C. M. McMullin and N. J. Gogan. 1962, 2p. incl. illus. 3 refs. (Technical rept. no. 5)
(Contract N62558-2381, Proj. NR 051-417)
Unclassified report

DESCRIPTORS: *Metalorganic compounds, *Complex compounds, *Reduction (Chemistry), Oxidizers, Cycloalkanes, Alkenes, Carbonyl radicals, Chromium compounds, Chemical reactions, Benzenes (Radical), Oxo (O=ring).

AD-296 878 Div. 4
(TISTM/RGR) OTS price $2.60

Mallinckrodt Chemical Lab., Harvard U., Cambridge, Mass.
ORGANO SILYLETHYLENEDIAMINE COMPOUNDS III.
STRUCTURAL INVESTIGATIONS ON ORGANOSILYLETHYLENEDIAMINE POLYMERS,
by Dieter Kummer and Eugene G. Rochow. Dec 62, 18p. illus.
(Contract Nonr-1866(13))
Unclassified report

DESCRIPTORS: *Silicon compounds, *Polymers, Silanes, Nuclear magnetic resonance, Chemical reactions, Molecular structure, Metalorganic compounds, Chemical analysis, Synthesis.

The polymers which are formed by the reaction of ethylenediamine and dimethyldichlorosilane are investigated by NMR methods. It is shown that these polymers consist of a mixture of linear and cyclic units. By heating the polymers to about 300 C by reaction with Me_3SiCl, polymers of the pure cyclic species are obtained. By reaction with ethylenediamine, polymers with a higher ratio of the linear component are formed. It is not possible to obtain a pure linear polymer even by reaction with an excess of ethylene diamine. (Author)

AD-296 971 Div. 4, 25
(TISTM/SJR) OTS price $1.60

Uppsala U. (Sweden).
INVESTIGATION OF THE PI ELECTRON SYSTEM OF URACIL WITH DIFFERENT SEMIEMPIRICAL METHODS,
by J. Ladik and K. Appel. 1 June 62, 13p. incl. illus. tables, 11 refs. (Technical note no. 79)
(Contract AF 61(052)351)
(ARL 63-7) Unclassified report

DESCRIPTORS: *Nucleotides, *Excitation, *Molecular structure, Electron transitions, Energy, Matrix algebra.

The pi-electron system of uracil was treated with the aid of the simple Huckel approximation, of the Huckel-CI method, of the semiempirical SCF-LCAO-MO method and with the SCF-LCAO-MO-CI method. The excitation energies and oscillator strength values of the first four excited states were calculated. The calculations were performed with two different approximations for the form of the inter-pi-electronic repulsion integrals (gamma). The first excitation energy obtained with the aid of the Huckel-CI method gives good agreement with the experimental value in the case of one series of gamma integrals. The SCF calculation in general has given worse results than the Huckel method taking into account the interaction of the pi electrons and a limited CI (4 configurations) for the excited states. Since the interconfigurational matrix elements are very small, the CI has not a large influence on the results. The conclusion was drawn that neither of the mentioned semiempirical methods is suitable in its present form for the calculation of the spectra of heterocyclic molecules containing more than one heteroatom. The possibilities for the improvement of the methods are briefly mentioned. (Author)

AD-296 988 Div. 4
(TISTM/EJH) OTS price $1.60

Cornell U., Ithaca, N. Y.
SYNTHESIS OF GEM-DISUBSTITUTED THIAZOLINES.
Final technical rept., 1 Oct 60-31 May 62,
by Thomas C. Bruice. 31 May 62, 12p. illus. 10 refs.
(Grant DA-MEDDH-61-19)
Unclassified report

DESCRIPTORS: *Heterocyclic compounds, *Organic sulfur compounds, *Organic compounds, *Nitrogen heterocyclics, *Sulfur heterocyclics, Chemical reactions, Synthesis, Infrared spectroscopy, Molecular structure, Nitrogen compounds, Oxides, Oxygen heterocyclics.

Contents:
Synthesis of gem-disubstituted thiazolines
Preparation of 1,1-disubstituted ethyleneoxide
Preparation of 1,1-disubstituted ethylenesulfide
Ammonolization
Ring opening of gem-disubstituted ethyleneimine with thiolacetic acid
Preparation of 2-methyl-5,5-dimethyl-thiazoline

5. COMMUNICATIONS

AD-296 067 Div. 5
(TISTE/CRJ) OTS price $3.60

RAND Corp., Santa Monica, Calif.
SUBMARINE TELEPHONE CABLES AND INTERNATIONAL TELECOMMUNICATIONS,
by R. T. Nichols. Feb 63, 35p. incl. tables, 11 refs. (Research memo. no. RM-3472-RC)
Unclassified report

DESCRIPTORS: *Voice communication systems, *Telephone communication systems, *Telephone lines, Costs, Telegraph systems, Operation, Telephone equipment, Underwater equipment, Underwater.

Laying submarine telephone cables is now one of the most rapidly growing industries in the world. Three cable-laying vessels have been or will be put into service in the six months from October 1962 to March 1963. New factories which will produce submarine telephone cable are being built in the United States, England, and Japan. A new factory which makes the type of repeaters now used on United States telephone cables was recently completed. The value of the investment in long-distance submarine telephone cables was $210,000,000 at the end of 1962; during the next three years alone (1963, 1964, and 1965) cables will be laid with a value of $400,000,000. With allowance for a substantial growth in demand for overseas telecommunications services (but without allowance for the effect on volume of any future reductions in prices of such services), it appears that the present and projected telephone cable facilities will be adequate to meet demands on the North Atlantic route until 1965 and on other routes for a few more years. (Author)

AD-296 412 Div. 5, 8
(TISTP/FR) OTS price $7.60

Research Lab. of Electronics, Mass. Inst. of Tech., Cambridge.
A COMMUNICATION ANALYSIS OF HIGH-FREQUENCY IONOSPHERIC SCATTERING.
Master's thesis,
by Goran Einarsson. 15 Nov 62, 76p. incl. illus. 27 refs. (Technical rept. no. 400)
(Contract DA 36-039-sc-78108, Proj. 3-99-00-000 and Grant DA-SIG-36-039-61-G14)
Unclassified report

DESCRIPTORS: *Ionospheric propagation, Multipath transmission, Statistical analysis, Radio receivers, Filters (Electromagnetic wave), Radio waves, High frequency.

A communication scheme for random multipath channels is investigated. During predetermined intervals the transmitter sends sounding signals that receiver uses to predict behavior of channel during intermediate time when communication is performed. It is assumed that channel varies slowly, and additive noise in receiver is low. The possibility of representing a multipath channel as a time-variant filter is investigated. A sampling theorem for linear bandpass filters is derived, and expected results when it is used to represent a single fluctuating path with Doppler shift are discussed. (Author)

AD-296 415 Div. 5, 8
(TISTE/OHD) OTS price $2.60

Philco Corp., Palo Alto, Calif.
DETERMINATION OF THE SPECTRUM OF A CARRIER PHASE-MODULATED BY A BI-PHASE SUBCARRIER.
Technical operating rept.,
by R. Chin and S. Ginsburg. 25 Jan 63, 18p. incl. illus. table (Rept. no. WDL-TR1900)
(Contract AF 04(695)113)
Unclassified report

DESCRIPTORS: *Radiofrequency spectroscopy, *Phase modulation, *Digital systems, Mathematical analysis, Statistical functions, Probability, Radio communication systems.

It was desired to obtain the spectrum of a bi-phase subcarrier, that switches phase every bit period, phase-modulating a carrier. Much information on system requirements can be obtained from this spectrum. The condition described above implies the worst case with regard to bandwidth. As will be seen, the minimum IF bandwidth is twice the sum of the subcarrier frequency and one-half the switching frequency. It will also be seen that components beyond the third harmonic are appreciably small and may be neglected. The means of mechanizing the above system, important waveforms, the power spectrum of the bi-phase subcarrier, and the relative magnitudes of the phase modulator output are shown. The derivation of the latter is given. (Author)

AD-296 490 Div. 5
(TISTP/TL) OTS price $1.10

Lincoln Lab., Mass. Inst. of Tech., Lexington.
BLOCKS IN ERROR AND PARETO'S LAW,
by B. J. Moriarty. 28 Jan 63, 5p. incl. illus.
(Rept. no. 25G-15)
(Contract AF 19(628)500)
(AFESD TDR 63-16) Unclassified report

DESCRIPTORS: *Radio telephone, *Radio teletype systems, *Errors, Statistical analysis, High frequency, Data transmission systems, Data storage systems, Radio communication systems, Circuits, Analysis.

6. DETECTION

AD-296 071 Div. 6
(TISTW/PCR) OTS price $2.60

Air Force Proving Ground Command, Eglin Air Force Base, Fla.
ACTIVE RADAR AUGMENTER EVALUATION. A VALIDATED MATHEMATICAL APPROACH,
by John F. Kantak. Jan 63, 26p. incl. illus. 7 refs. (Rept. no. APGC TDR 63-1)
(Proj. 7826W21)
Unclassified report

Division 6 - DETECTION

DESCRIPTORS: *Radar reflectors, *Radar echo areas, Radar antennas, Antenna configurations, Antennas, Radar, Radar signals, Ranges (Distance), Equations, Power, Antenna radiation patterns, Attenuation, Measurement, Transponders, Power amplifiers, S band, Radar targets, Towed bodies, Traveling wave tubes, Mathematical analysis, Theory.

The purpose of this study was to establish a technique for determining the radar cross-sectional area of any active radar augmenter. This proposal suggests that mathematical calculations are sufficiently accurate to allow test personnel to base conclusions on the calculated values. The theory and mathematics of the proposed technique were established, and an experiment was accomplished to obtain the accuracy of the computations. The overall accuracy of the method depended upon the accuracy of the computations plus the accuracy of the measuring instruments. Technique accuracy was found to be ±1 db. Since an accuracy has been established, this technique can be utilized by test personnel when evaluating active radar augmenters. A five-step procedure for evaluating an augmenter is presented. (Author)

AD-296 098 Div. 6, 8, 15
(TISTW/JEA) OTS price $1.60

General Electric Co., Syracuse, N. Y.
GZ BEARING ANGLE ERROR RESULTING FROM SENSOR SITING ERROR.
16 Jan 63, 9p. incl. illus. (Rept. no. SE-TM-163-17)
(Contract AF 19(628)514)
Unclassified report

DESCRIPTORS: *Antennas, *Direction finding, *Trigonometry, Direction finding signals, Ranges (Distance), Velocity, Wind, Pressure, Structures, Mathematical analysis, Errors, Curved profiles.

The requirements for accuracy of EM/DF site location for two bearing errors are analyzed. Results indicate that the required location accuracy is of the order of + or - 100 feet. This research deals only with accuracy of antenna location and not with the accuracy of pointing. (Author)

AD-296 381 Div. 6
(TISTW/JEA) OTS price $4.60

Hudson Labs., Columbia U., Dobbs Perry, N. Y.
THE SPARK GAP AS AN ACOUSTIC SOURCE,
by M. Vertner Brown and James Ricard. 30 Oct 59, 42p. incl. illus. tables, 5 refs. (Technical rept. no. 80; CU-101-62)
(Contract Nonr-26684)
Unclassified report

DESCRIPTORS: *Acoustic ranges, *Sound signals, *Surface areas, *Sound transmission, Electric discharges, Explosions, Hydrophones, Crystals, High frequency, Amplitude modulation, Hydrodynamic configurations, Sound ranging, Pulse amplifiers, Pulse modulation, Control, Sparks, Sources, Reflection, Underwater.

AD-296 436 Div. 6
(TISTE/OHD) OTS price $4.60

Naval Ordnance Test Station, China Lake, Calif.
A STUDY OF UNDERWATER ACOUSTICAL IMAGING,
by E. E. Curry. Nov 62, 42p. incl. illus.
(NOTS TP 2882)
(NAVWEPS rept. no. 7889) Unclassified report

DESCRIPTORS: *Sonar equipment, *Images, *Scanning sonar, Underwater objects, Analysis, Underwater sound, Sound transmission, Transducers (Acoustic), Impedance matching, Communications theory.

TV-like pictures, showing position and shape of underwater missile test items are obtained by using a directional-scanning sonar method. This report is a systems study made to investigate the problems of acoustical imaging within the broad concept of such an instrumentation device. It covers the interrelationship of absorption, bandwidth, information-theory limits, and beam theory for transducers and acoustical lenses. (Author)

AD-296 474 Div. 6, 30
(TISTW/JEA) OTS price $2.60

Defense Research Lab., U. of Texas, Austin.
MODIFYING A DYMEC DY-5304 TIME INTERVAL RECORDING SYSTEM TO INCREASE ITS DATA HANDLING CAPABILITY,
by George G. Moore. Dec 62, 5p. illus. (Rept. no. DRL-490; CF-2990)
(Contract NOrd-16498)
Unclassified report

DESCRIPTORS: *Satellites (Artificial), *Doppler systems, *Recording systems, *Data processing systems, Data transmission systems, Data storage systems, Doppler radar, Photographs, Computer storage devices, Switching circuits, Time switches, Delay circuits, Tracking, Time interval counters, Digital computers.

Modification of the Dymec DY-5304 time interval counting system at doppler tracking station 002 to provide simultaneous reduction of two channels of doppler data is described. (Author)

AD-296 493 Div. 6
(TISTW/RD) OTS price $2.60

Lincoln Lab., Mass. Inst. of Tech., Lexington.
THE RESISTANCE OF BATS TO JAMMING,
by D. R. Griffin, J. J. G. McCue and A. D. Grinnell. 23 Oct 62, 26p. incl. illus. tables, 18 refs. (Technical rept. no. 285)
(Contract AF 19(628)500; In cooperation with Biological Labs., Harvard U., Contract Nonr-266(12)
(AFESD TDR 62-275) Unclassified report

DESCRIPTORS: *Bats, *Signals, *Sound signals, *Radio signals, Noise generators, Loudspeakers, Interference, Radio jamming, Acoustics, Signal-to-noise ratio, Detection.

Obstacle-avoidance by echolocating long-eared bats (Plecotus townsendii) was tested while the bats were flying in random noise. Previous experiments had indicated that bats could achieve a surprising degree of success when dodging wires in a room filled with random noise in the band 20 to 50 kc, which covers the fundamental frequencies in the pulses of orientation sound used by Plecotus. The present experiments show that at a given noise power per cycle, the effectiveness of masking was far greater for a 10- to 90-kc noise than for one that merely covered the fundamental frequencies in the bat pulses, but that the bats can still echolocate when the noise power, per cycle of bandwidth, exceeds the energy in the echo. Further broadening of the noise spectrum, to an upper limit exceeding 120 kc, had no discernible effect. The effect of coherent noise, originating in a single random-noise generator connected to all the loudspeakers, was compared with the effect of non-coherent noise, which originated in four noise generators, each of which supplied one-quarter

of the loudspeakers. In the noncoherent noise field, a bat always received noise from at least two independent noise generators. Though the bats seemed to fly with more assurance in coherent than in noncoherent noise, obstacle avoidance in the coherent noise was only slightly and inconsistently better. (Author)

AD-296 517 Div. 6
(TISTW/RD) OTS price $2.60

Armour Research Foundation, Chicago, Ill.
UNCOOLED IR DETECTOR FOR THE TEN MICRON REGION.
Summary technical rept., 1 Apr-31 Dec 62,
by William D. Brennan. 12 Feb 63, 23p. incl. illus. 8 refs. (Rept. no. ARF-1208-12)
(Contract NOw 62-0751-c)
Unclassified report

DESCRIPTORS: *Infrared detectors, Photoconductivity, Crystals, Infrared radiation, Semiconductors, Cadmium compounds, Sulfides, Crystal lattices, Crystal lattice defects.

The development of an uncooled infrared detector for the 8 micron to 12 micron atmospheric window is described. In contrast to all other quantum infrared detectors, the principle of operation of the proposed detector does not involve free carrier generation by the infrared radiation. Instead, the detector shall use the absorption of infrared energy by excitons to quench an exciton-induced photoconductivity. Methods and techniques to observe exciton-induced photoconductivity and quenching by infrared radiation are discussed. Some 90 crystals were examined, and while the quenching effect was never observed, 11 of these crystals appear to exhibit the required exciton processes. The experimental procedures are being modified to emphasize the observation of exciton transport and to remove some interferences that might have inhibited or masked the quenching in previous experiments. (Author)

AD-296 554 Div. 6
(TISTW/JEA) OTS price $2.60

Microwave Research Inst., Polytechnic Inst., Brooklyn, N. Y.
FILTERS FOR DETECTING MOVING UNDERWATER OBJECTS,
by Arthur E. Laemmel. 21 June 62, 19p. incl. illus. tables, 5 refs. (Rept. no. PIBMRI-1037-62)
(Contract Nonr-83928)
Unclassified report

DESCRIPTORS: *Hydrodynamic configurations, *Wake, *Underwater object locators, *Acoustic filters, Integral transforms, Motion, Frequency, Frequency analyzers, Functions, Probability, Harmonic analyzers, Integrals, Detection, Acoustic equipment.

The detection of a wake is usually very difficult because of its small amplitude, and because of the natural waves which are usually present. It is shown that the three dimensional spectra of the wake and of the natural waves are of different forms, and that this difference might be used to design a filter to enhance the wake and attenuate the natural waves. Some of the practical limitations on such a filter are also discussed. (Author)

AD-296 583 Div. 6, 30
(TISTW/JEA) OTS price $6.60

Naval Research Lab., Washington, D. C.
SYMMETRY PATTERN RECOGNITION SYSTEM II,
by F. R. Fluhr, D. J. McLaughlin and others.
10 Jan 63, 67p. incl. illus. tables, 3 refs.
(NRL rept. no. 5847)
Unclassified report

DESCRIPTORS: *Satellites (Artificial), *Identification systems, *Data processing systems, *Delay lines, *Time signals, Automatic gain control, Analog computers, Pulse amplifiers, Operation, Digital computers, Phase studies, Digital systems, Analog-to-digital converters, Clocks, Timing devices, Pulse counters, Trigger circuits, Voltmeters, Time switches, Wave analyzers, Phase detectors, Delay circuits, Detection, Identification, Satellite networks, Analog-digital computers, Switching circuits, Processing.

Automatization of satellite detection in the SPASUR system requires a means of discriminating against nonsatellite responses. Earlier, a study of SPASUR automatic gain control (agc) amplitude response led to developing a pattern recognitions system based upon the inherent symmetry of a typical signal due to a satellite pass. A presentation is given of the Symmetry Recognition System II, and the technical performance at the San Diego Space Surveillance Station. In a 10-hour period, 106 alerts were generated; 20 were satellites correctly called symmetrical, and 39 were nonsatellites. Symmetry responses were generated on 14 alerts; some may have been due to remote, unverified satellite passes. No symmetry response was given to 33 verified satellites. Seven of these passes were missed due to agc pattern distortion by the SPASUR comb-filter switching action. Of the remaining signals, 25, below the agc noise level, could not be examined for symmetry. Design advances in the SPASUR system minimized the requirement for pattern recognition processing. (Author)

AD-296 751 Div. 6
(TISTW/PCR) OTS price $1.60

Navy Electronics Lab., San Diego, Calif.
INTERLEAVED-PLATE ELECTRODYNAMIC TRANSDUCER. PART III. DESIGN AND PERFORMANCE OF MODEL 3B,
by F. R. Abbott. 20 Dec 62, 16p. incl. illus. 3 refs. (NEL rept. no. 1151)
Unclassified report

DESCRIPTORS: *Transducers (Acoustic), *Underwater sound generators, Sonar equipment, Design, Photographs, Operation, Metal plates, Sonar.

AD-296 752 Div. 6, 8
(TISTE/OHD) OTS price $.75

Navy Electronics Lab., San Diego, Calif.
AN ELECTRONIC GENERATOR OF RANDOM NUMBERS,
by G. M. Dillard and R. E. Simmons. 21 Dec 62, 24p. incl. illus. tables, 6 refs. (NEL rept. no. 1152)
Unclassified report

DESCRIPTORS: *Pulse generators, Radar equipment, Sequences, Digital systems, Monte Carlo method, Statistical functions.

AD-296 775 Div. 6, 8
(TISTE/OHD) OTS price $1.10

Cornell Aeronautical Lab., Inc., Buffalo, N. Y.
POLARIZATION-DEPENDENCE IN THE PERFORMANCE OF A GROUND PLANE CROSS SECTION RANGE,
by Robert J. Wohlers. Dec 62, 7p. incl. illus.
(Rept. no. AP/RIS-2)
Unclassified report

DESCRIPTORS: *Radar echo areas, *Radar reflections, *Antenna radiation patterns, Mathematical analysis, Radar antennas, Antenna lobes, Theory, Polarization, K band.

The ground plane range, used successfully for antenna pattern measurements, has been proposed as a technique for radar cross section measurement. While this approach offers recognized advantages, certain features with respect to polarization behavior warrant further study. A brief analytical examination of polarization effects was made, and it was accompanied by experimental studies upon a Ka-band CW radar cross section range which confirmed the analytical predictions. (Author)

AD-296 923 Div. 6
(TISTW/JEA) OTS price $5.60

Sperry Microwave Electronics Co., Clearwater, Fla.
DEVELOPMENT OF C-BAND BEACON FERRITE DUPLEXER PHASE III.
Quarterly progress rept. no. 3, 31 July-30 Oct 62, by J. Clark. 30 Oct 62, 1v. incl. illus. 24 refs. (Rept. no. SJ-220-0037-3)
(Contract DA 36-039-sc-89158, Proj. 3619-03-001)
Unclassified report

DESCRIPTORS: *Radar duplexers, *Limiters, *Waveguide couplers, Impedance matching, Band-pass filters, Resonance, Ferrites, Resnatrons, Design, Mathematical analysis, Wave transmission, Transmission lines, Waveguides, C band, Magneto-optic effect.

This program is concerned with a C-band duplexer-limiter package meeting stringent electrical and mechanical requirements. The program has involved principally the investigation of four components: a four port coaxial junction circulator, a coaxial subsidiary resonance limiter, various forms of the multisphere gyromagnetic coupler, and a varactor limiter. Progress on all of these components is made. A detailed theoretical analysis of the multisphere coupler and experimental results with the varactor limiter are presented for the first time. (Author)

AD-296 948 Div. 6, 8, 25
(TISTW/PCR) OTS price $2.60

Quantum Electronics Lab., Calif. Inst. of Tech., Pasadena.
A MODIFIED FABRY-PEROT INTERFEROMETER AS A DISCRIMINATION FILTER AND A MODULATOR FOR LONGITUDINAL MODES,
by Helmut K. V. Lotsch. 1 Sep 62, 19p. illus.
(Scientific rept. no. 2)
(Contract AF 19(604)8052, Proj. 4600)
(AFCRL 62-748) Unclassified report

DESCRIPTORS: *Interferometers, *Electric filters, *Modulators, Masers, Reflectors, Dielectrics, Equations, Mathematical analysis, Discriminators.

Kleinman and Kisliuk proposed a symmetric modified Fabry-Perot interferometer in which, by providing an extra reflecting surface outside and parallel to the maser plates, certain longitudinal Fabry-Perot orders become more lossy than others. By that is meant modes with lower losses oscillate preferentially. In this paper an unsymmetric modified interferometer is investigated. The space between the active medium and the extra reflecting surface is assumed to be filled by an arbitrary, lossless dielectric medium. When the ratio of this dielectric constant to that of the active medium is modulated, the analysis shows that longitudinal modes are modulated in their amplitude and frequency. In particular, the modulation of this ratio about the value 1 appears to be very interesting, since the modes with the lowest losses, e.g., for ratios larger than 1, possess the largest losses for ratios smaller than 1, and vice versa. (Author)

AD-296 954 Div. 6
(TISTW/JEA) OTS price $3.60

Rome Air Development Center, Griffiss Air Force Base, N. Y.
A NONUNIFORMLY DISTRIBUTED PARAMETER MATCHING NETWORK FOR THE MICROWAVE FREQUENCIES,
by Daniel J. Kenneally. Jan 63, 32p. incl. illus. 19 refs. (Rept. no. RADC TDR 63-17)
(Proj. 8505)
Unclassified report

DESCRIPTORS: *Microwave networks, *Impedance matching, *Transmission lines, *Electromagnetic wave reflections, Distribution, Transformers, Design, Electromagnetic pulses, Propagation, Integral transforms, Integration, Bessel functions, Continuum mechanics, Attenuation, Scattering, Wave transmission, Electromagnetic waves, Waveguide filters, Microwave frequency, Differential equations, Coaxial cables, Reflections, Waveguides.

A nonuniform section of coaxial transmission line is investigated as an impedance matching network. Assuming that the purity of the dominant transverse electromagnetic (TEM) mode is maintained, the coaxial transformer section proposed is one in which the distributed series inductance and shunt capacitance are prescribed mathematical functions of the axial cylindrical coordinate, that is, the direction of propagation. These variations are expressed as a variable characteristic impedance in the explicit form of a half-period cosinusoidal distribution. Starting with the appropriate differential equations for the nonuniform line voltages and currents, the basic Riccati-type differential equation governing the reflection coefficient in a nonuniform section is presented. In a conventional manner, an expression is then developed for the complex reflection coefficient at the input reference plane when the output port is terminated in a matched load. For given ranges in design parameters the magnitude of this integral expression is evaluated for this specific taper-cosinusoidal. The integration was performed on a Burrough's Datatron 205 computer using a Gaussian quadrature technique. (Author)

7. ELECTRICAL EQUIPMENT

AD-296 020 Div. 7, 8
(TISTP/WH) OTS price $8.60

Martin-Marietta Corp., Baltimore, Md.
A STUDY PROGRAM ON CESIUM VAPOR-FILLED THERMIONIC CONVERTERS HAVING IRIDIUM EMITTERS.
Yearly summary rept., 1 Nov 61-30 Oct 62, by M. E. Talaat, D. S. Trimmer and A. J. Kennedy. Dec 62, 87p. incl. illus. 3 refs. (MND rept. no. 2934)
(Contract Nonr-363900, Proj. NR 099-363)
Unclassified report

DESCRIPTORS: *Thermionic emission, *Energy conversion, *Plasma physics, *Work function, *Cesium, *Discharge tubes, *Cathodes, Iridium, Rhenium, Rhodium, Platinum, Electric discharges, Adsorption, Electrodes, Filaments.

An extensive mapping of the performance of cesium vapor-filled energy conversion devices was obtained for the high vacuum work function emitter materials, iridium and rhenium, for the interelectrode gap of 0.030-in. Characteristic current-versus-voltage curves and summaries of the output power density and efficiency are given for the emitter temperature range of 1550-2000 K and the cesium temperature range of 475-600 K. The data shows a systematic superiority of iridium to rhenium. Tests with a platinum emitter device confirm the trend of good performance in cesium vapor with high vacuum work function emitter materials. Data is given showing a highly precise agreement between two iridium filament emitter devices and an electron bombardment heated device with iridium emitter. At the emitter temperature of 1700 K, liquid cesium temperature of 525 K, and interelectrode gap of 0.030-in., the output power density of the three devices was 5.6 ± 0.2 w/sq cm. and the energy conversion efficiency was 14.25 ± 1.25%. (Author)

AD-296 065 Div. 7
(TISTE/CRJ) OTS price $1.60

ITT-Surprenant Mfg. Co., Clinton, Mass.
DEVELOPMENT AND CONSTRUCTION OF WATER-TIGHT CABLES RG 11 a/u-RG 217/u-RG 218/u.
Interim development rept. no. 2, 29 Sep 62-15 Jan 63.
28 Jan 63, 14p. incl. illus.
(Contract NObsr-87574, Proj. SR008-80-302)
Unclassified report

DESCRIPTORS: *Coaxial cables, Dielectrics, Electrical impedance, Attenuation, Test methods, Hydrostatic pressure, Copper, Dielectric properties, Halocarbon plastics, Moistureproofing.

AD-296 169 Div. 7, 8
(TISTE/OHD) OTS price $3.60

International Resistance Co., Philadelphia, Pa.
RESISTORS, FIXED FILM TYPE GENERAL PURPOSE.
Quarterly progress rept. no. 12, 1 Apr-30 June 62,
by Jerome G. Burns. 30 June 62, 35p. incl. tables.
(Contract DA 36-039-sc-81283)
Unclassified report

DESCRIPTORS: *Fixed resistors, *Resistors, Moistureproofing, Industrial production, Manufacturing methods, Probability, Films, Reliability (Electronics).

Performance data from RC-07, .29 megohm and RC-20, .20 megohm resistors is presented for informational purposes. Mechanism of failure studies have identified two modes of failure: (1) damaged resistive film, and (2) imperfect cp termination beads. All reliability testing has been completed except for 100 C load life and 175 C no load. In order to meet the failure rate goal of .1%, some efficient nondestructive screening test will be developed. To this end, a 96 hour load life ''burn-in'' screening test was tried. (Author)

AD-296 193 Div. 7, 8
(TISTE/OHD) OTS price $12.00

General Electric Co., West Lynn, Mass.
VOLTAGE REGULATION AND CONVERSION IN UNCONVENTIONAL ELECTRICAL GENERATOR SYSTEMS.
Progress rept. nos. 1-2, 1 Jan-30 June 62.
30 June 62, 166p. incl. illus. tables, 5 refs.
(Contract NOw 62-0984-d; Continuation of Contract NOw 60-0824-c)
Unclassified report

DESCRIPTORS: *Electric power production, *Voltage regulators, *Fuel cells, *Thermoelectricity, Design, Transients, Switching circuits, Transistors, Weight, Mathematical analysis, Capacitors, Coils, Circuits, Magnetic cores, Stability, Transformers, Inverters.

The study of voltage regulation and conversion in unconventional electrical generator systems is presented. The approach and work plans for the complete study are given. The progress to date in developing a light-weight, efficient dc-to-dc circuit known as the flyback circuit is included. Information giving the results to date in a high-frequency switching investigation aimed at reducing circuit weight is presented. A discussion of power transistor characteristics pertinent to voltage conversions circuits is included. Design data permitting the design of a minimum weight inductor or transformer for any given power loss is given. (Author)

AD-296 229 Div. 7, 25
(TISTM/SJR) OTS price $8.10

Pennsylvania State U. Mineral Industries Experiment Station, University Park.
THE MODE OF OPERATION OF POROUS DIFFUSION ELECTRODES FOR FUEL CELLS,
by L. G. Austin. Nov 62, 81p. incl. illus.
23 refs. (Rept. no. 3)
(Contract DA 49-186-502-ORD-917)
Unclassified report

DESCRIPTORS: *Fuel cells, *Diffusion, *Electric currents, Electrodes, Porosity, Theory.

A number of simple models of diffusion electrodes are examined theoretically. The results are expressed in forms whereby it should be possible to test the models experimentally, and make predictions regarding the effects of variation of the pertinent parameters. It is not expected that the theories will completely explain operating data on complex electrode structures. It should be possible to test them, however, on experimental equipment designed to approximate to the models chosen. (Author)

AD-296 238 Div. 7
(TISTE/CAM) OTS price $1.60

Martin-Marietta Corp., Baltimore, Md.
DEVELOPMENT OF AN ENCAPSULATED THERMIONIC POWER GENERATOR.
Quarterly technical progress rept., 1 Nov 62-31 Jan 63.
15 Feb 63, 5p. illus. (Rept. no. MND-2945-1)
(Contract AF 33(657)10077, Proj. 8173)
Unclassified report

DESCRIPTORS: *Nuclear power plants, *Generators, *Thermoelectricity, Power equipment, Metal seals, Cathodes, Electrodes, Refractory coatings, Processing, Electric power production.

The engineering design of the double diode thermionic power generator has been completed. Fabrication of several component parts has been initiated. The parts for the fueled emitters are almost completely fabricated with only assembly and final machining remaining. The manufacture of other generator components including the

collector temperature control assembly and the ceramic-to-metal seals has been initiated. The engineering design of the clad fuel elements has been completed and the first element, similar in configuration to the fueled emitter, has been fabricated. The vacuum test chamber has been fabricated and is undergoing preliminary outgassing. (Author)

AD-296 283 Div. 7, 20
(TISTA/GEC) OTS price $1.60

Army Electronics Research and Development Lab., Fort Monmouth, N. J.
TRANSIENT AND STEADY-STATE NUCLEAR RADIATION EFFECTS ON GERMANIUM PNP ALLOY TRANSISTORS,
by Edwin T. Hunter and Harry E. Wannemacher.
Oct 62, 13p. incl. illus. 7 refs. (AELRDL technical rept. no. 2310)
(Proj. 3A99-21-001-01)
Unclassified report

DESCRIPTORS: *Transistors, Nuclear energy, Tests, Test methods, Electrical properties, Germanium alloys, Radiation damage.

AD-296 292 Div. 7
(TISTA/FRL) OTS price $1.60

International Resistance Co., Philadelphia, Pa.
RESISTORS, FIXED FILM TYPE GENERAL PURPOSE.
Quarterly progress rept. no. 13, 1 July-30 Sep 62,
by Jerome G. Burns. 30 Sep 62, 16p. incl. tables.
(Contract DA 36-039-sc-81283)
Unclassified report

DESCRIPTORS: *Fixed resistors, Films, Tests, Storage, Life expectancy, Manufacturing methods, Statistical analysis, Reliability.

Fixed film resistors were shelf-life and reliability tested. A statistical analysis performed on the 175 C no-load data indicated that 175 C no-load performance is dependent on range and that only the lowest ranges have any possibility of passing this test successfully. Manufacture of resistors for pilot plant testing was begun. Batch screening tests such as: pull, X-ray and noise have been incorporated into the Pilot Run manufacturing to eliminate 'sports' from the process. (Author)

AD-296 360 Div. 7, 32
(TISTM/SJR) OTS price $6.60

Lockheed Aircraft Corp., Sunnyvale, Calif.
ELECTROCHEMICAL FUEL CELLS: AN ANNOTATED BIBLIOGRAPHY.
comp. by Scott J. Buginas. Dec 62, 56p.
117 refs. (Special bibliography no. SB-62-51; Rept. no. 2-99-62-5; Suppl. to AD-251 660 and AD-253 809)
Unclassified report

DESCRIPTORS: *Fuel cells, Hydrogen, Oxygen, Alkaline cells, Hall effect, Catalysis, Electrodes, Electrolytes, Ion exchange resins, Membranes, Silver compounds, Calcium compounds, Nickel compounds, Zinc compounds, Oxides, Photochemistry, Electrochemistry, Solar radiation, High temperature research, Spacecraft, Phosphorus compounds, Dissociation, Chlorine, Chlorides, Low temperature research, Bibliographies.

This bibliography consists mostly of references dated late 1961 and the first 9 months of 1962. It is a supplement to the following LMSC Electrochemical Fuel Cell bibliographies: SRB-60-5 (AD-251 660) Nov 1960, SRB-60-5 (AD-253 809) Feb 1961, and SRB-62-2, Mar 1962. Search completed October 1962. (Author)

AD-296 367 Div. 7
(TISTM/SJR) OTS price $5.60

RCA Defense Electronic Products, Princeton, N. J.
APPLIED RESEARCH PROGRAM ON HIGH-TEMPERATURE RADIATION-RESISTANT SOLAR-CELL ARRAY.
Quarterly technical progress rept. no. 3, Nov 62-Jan 63.
31 Jan 63, 49p. incl. illus. tables, refs.
(Rept. no. AED 1816)
(Contract AF 33(657)8490)
Unclassified report

DESCRIPTORS: *Solar cells, *Electric power production, Gallium compounds, Arsenides, Effectiveness, Storage, Heat, Reflection, Inhibition, Silicon compounds, Oxides, Coatings, Infrared spectroscopy, Silicon, Soldered joints, Lead, Failure (Mechanics), Test methods, Silicone plastics, Elasticity, Low temperature batteries, Electron bombardment, Radiation damage, Temperature, Operation, Power supplies.

AD-296 426 Div. 7
(TISTA/FRL) OTS price $2.60

Melpar, Inc., Falls Church, Va.
A THIN-PLATE BATTERY.
Supplement to Quarterly rept. no. 11, 15 Nov 62-15 Feb 63 on Molecular Circuit Development,
by R. T. Foley, J. Smit and others. 15 Feb 63, 27p. incl. illus. tables.
(Contract NOw 60-0362-c)
Unclassified report

DESCRIPTORS: *Alkaline cells, Ammonia, Electrolytic cells, Encapsulation, Tests, Analysis, Chromatographic analysis, Materials, Water, Feasibility studies, Storage batteries, Wet cells, Miniature electrical equipment.

A program directed toward demonstrating the feasibility of miniaturizing the liquid ammonia activated cell is reported. The liquid ammonia activated cell, utilizing a reducible organic compound at the cathode and a light, active metal anode has the theoretical capability of meeting the energy requirement. The solvent for the system, liquid ammonia, satisfies the temperature requirement. (Author)

AD-296 438 Div. 7, 8
(TISTE/CAM) OTS price $5.60

General Electric Co., Holyoke, Mass.
HIGH POWER, HIGH VOLTAGE, AUDIO FREQUENCY TRANSFORMER DESIGN MANUAL.
Quarterly interim development rept. no. 2, 1 Oct-31 Dec 62.
1 Jan 63, 1v. incl. illus. tables, refs.
(Contract NObsr-87721, Proj. SR-008-08-02)
Unclassified report

DESCRIPTORS: *Transformers, Inductance, Coils, Capacitance, Electromagnetic properties, Electrical properties, Electric insulation, Electric potential, Electrodes, Mechanical properties, Coolants, Extremely low frequency, Very low frequency, Audiofrequency.

AD-296 569 Div. 7, 4
(TISTM/EJH) OTS price $1.60

Rensselaer Polytechnic Inst., Troy, N. Y.
ELECTROCHEMICAL BEHAVIOR OF A PALLADIUM HYDROGEN DIFFUSION ELECTRODE,
by L. Lederer and N. D. Greene. 25 Sep 62, 9p. incl. illus. table, 3 refs. (Scientific rept. no. 2)
(Contract AF 19(604)8377)
(AFCRL 62-1051) Unclassified report

DESCRIPTORS: *Electrodes, *Palladium, *Hydrogen, Catalysts, Diffusion, Polarization, Electric currents, Oxides, Density, Electrochemistry, Fuel cells.

Electrochemical studies on palladium hydrogen diffusion electrodes indicate that sufficiently high current densities can be achieved making their use as fuel cell hydrogen electrodes practically feasible. Using a palladium oxide catalyst, formed by heating the electrode in air at 600 C, maximum current densities of 75 ma/sq. cm at a solution temperature of 24 C and 140 ma/sq. cm at 43.5 C were achieved. (Author)

AD-296 861 Div. 7, 12
(TISTM/RGR) OTS price $3.00

Allison Div., General Motors Corp., Indianapolis, Ind.
DESIGN AND DEVELOPMENT OF A LIQUID METAL FUEL CELL.
Final report on Static Energy Conversion Technology,
by B. Agruss, H. R. Karas, and V. L. Decker. Dec 62, 143p. incl. illus. tables, 35 refs.
(Contract AF 33(657)7847, Proj. 8173)
(ASD TDR 62-1045) Unclassified report

DESCRIPTORS: *Potassium, *Mercury, *Fuel cells, Electrolytic cells, Power supplies, Composite materials, Magnesium compounds, Oxides, Electrical conductance, Seals (Stoppers), Electrolytes, Ceramic materials, Energy conversion, Electric power production, Electrochemistry, Liquid metals, Design.

Substantial progress has been made in the study and operation of potassium-mercury cells and in pointing up problem areas requiring solution. Six different types of cells were run, some utilizing a ceramic matrix while others operated on a differential density principle. Certain cells were operated with flowing cathode metal, so that steadiness of operation and regenerative capability could be studied. Results confirmed this regenerative capability up to 60 mw/sq. cm, the operating level of the experiment. Liquid metal cell life was extended to as long as 550 hours to date. Current densities of 227 ma/sq. cm and power densities of 91 mw/sq. cm were achieved. Composite matrices composed of 6-micron MgO particles were produced, and electrical conductivities of discs of various electrolyte/MgO ratios were measured. Results conform to requirements of liquid metal cell systems. (Author)

AD-296 862 Div. 7, 20, 8
(TISTM/EJH) OTS price $4.60

Aerojet-General Nucleonics, San Ramon, Calif.
FEASIBILITY DETERMINATION OF A NUCLEAR THERMIONIC SPACE POWER PLANT.
Quarterly technical progress rept., 1 Nov 62-31 Jan 63.
31 Jan 63, 39p. incl. illus. (Rept. no. AN-856)
(Contract AF 33(657)8977, Proj. 8173)
Unclassified report

DESCRIPTORS: *Nuclear power plants, *Thermionic emission, *Electric power production, Heat exchangers, Liquid metals, Spacecraft, Reactor coolants, Cesium, Vapors, Materials, Manufacturing methods.

Contents:
TASK 2 - Liquid metal tubing - converter bond
General approach
Alumina coatings
Brazing studies
Conclusions
TASK 3 - Thermal transport analysis
Heat rejection
Reactor characteristics
TASK 4 - Series unit loop test
General loop configuration
Main heater
Heat sink
Surge tank
Thermionic generators

AD-296 894 Div. 7, 4
(TISTM/EJH) OTS price $1.60

Calvin Coll., Grand Rapids, Mich.
SILVER MIGRATION AND TRANSPORT MECHANISM STUDIES IN SILVER OXIDE-ZINC BATTERIES.
Quarterly technical progress rept. no. 3, 1 Nov 62-1 Feb 63,
by T. P. Dirkse and L. A. Vander Lugt. 1 Feb 63, 8p. illus.
(Contract AF 33(657)8689, Proj. 3145)
Unclassified report

DESCRIPTORS: *Alkaline cells, *Battery separators, *Silver, Electrochemistry, Transport properties, Electrodes, Silver compounds, Oxides, Zinc, Solubility, Electrolytes, Potassium compounds, Hydroxides, Tracer studies, Quantitative analysis, Materials.

A study was made of three methods whereby radioactive silver can be used to determine quantitatively the concentration of small amounts of silver dissolved in potassium hydroxide solutions. Good results were obtained by precipitating the dissolved silver as silver iodide and collecting this on a filter paper of sufficiently small pore size. The precipitated silver iodide was then counted. (Author)

AD-296 906 Div. 7, 4, 12
(TISTM/EJH) OTS price $1.75

Mallory, P. R. and Co., Indianapolis, Ind.
MERCURY CELL BATTERY INVESTIGATION.
Final rept., 15 Dec 61-15 Dec 62,
by J. M. Booe and R. E. Ralston. Jan 63, 59p. incl. illus. tables.
(Contract AF 33(657)7706, Proj. 8173)
(ASD TDR 62-1112) Unclassified report

DESCRIPTORS: *Storage batteries, *Power supplies, *Electrical power production, Electrodes, Electrochemistry, Electrolytes, Alkaline cells, Battery separators, Potassium compounds, Hydroxides, Mercury compounds, Silver, Zinc, Zinc compounds, Oxides, Materials, Spacecraft, Design.

The rechargeable electrochemical system Zn/KOH/HgO-Ag was investigated from the viewpoint of aerospace requirements. Two versions of an exploratory research cell, with accompanying pellet type reference electrode, were successfully used during positive and negative electrode charge-discharge experiments. Zn anodes containing high percentages of Hg were discharged with efficiencies over 90% at rates up to

2000 ma/sq. in. under uninhibited conditions. The system of Zn-Hg-Ag was found compatible with electrolyte containing zincate. A cell cup retaining member for the high Hg-Zn alloy was fabricated and employed in completed cells. Discharge utilization obtained was comparable to that obtained in the research cell. A comprehensive study of separator materials was made. Positive electrode densification experienced during cycle testing appears to be related to cycle depth. Use of Pd in the positive electrode alloy improved charge efficiency. (Author)

AD-296 942 Div. 7, 25
(TISTM/ODN) OTS price $2.60

Westinghouse Electric Corp., Dayton, Ohio.
500 C SILICON CARBIDE RECTIFIER PROGRAM.
Interim technical progress rept. no. 5, 1 Oct-31 Dec 62,
by H. C. Chang, R. B. Campbell and others.
Jan 63, 20p. incl. illus.
(Contract AF 33(657)7027, Proj. 7-727)
(ASD TR 7-727, vol. 5)
Unclassified report

DESCRIPTORS: *Crystal rectifiers, *Silicon compounds, *Diodes, Crystal growth, Crystals, Electrical properties, Processing, Stability, Encapsulation, Sublimation, Laboratory furnaces, Manufacturing methods, Single crystals, Electric potential, High-temperature research, Carbides.

Hexagonal silicon carbide crystals are being grown in a Kroll-type furnace by the sublimation technique. In order to obtain greater control over the growth variables a new furnace has been assembled and is being used in a series of experiments. This furnace should give valuable information on crystal growth parameters. The research on grown junction crystals has emphasized the preparation of crystals with a high degree of surface and internal perfection by studying the effect of radiation sinks and cavity geometry. The methods and materials of device fabrication are being studied and adapted to meet stability and quantity processing requirements. Electrical characteristics at various temperatures are given for several encapsulated rectifiers. The electrical properties of these rectifiers had been stabilized by an ambient atmosphere treatment prior to encapsulation. (Author)

8. ELECTRONICS AND ELECTRONIC EQUIPMENT

AD-296 001 Div. 8
(TISTE/CRJ) OTS price $2.60

Radio Corp. of America, Somerville, N. J.
GALLIUM ARSENIDE VARACTOR DIODES.
Quarterly rept. no. 2, 28 Sep-28 Dec 62,
by H. Kressel and G. A. Kupsky. 31 Jan 62, 19p. incl. illus. tables.
(Contract NObsr-87405, Proj. SR 008031)
Unclassified report

DESCRIPTORS: *Diodes (Semiconductors), *Frequency multipliers, Gallium compounds, Arsenides, Electric potential, K band, Superhigh frequency, Capacitance, Resistance (Electrical), Etched crystals, Temperature, Measurement, Electrical impedance, Frequency multipliers, Semiconductor devices.

Efforts were continued on the development of gallium arsenide varactor diodes capable of yielding 40% power conversion efficiency from 12 gc to 24 gc. Calculations, confirmed by experimental results, indicate that substantial improvements in series resistance may be achieved in non-epitaxial Gallium Arsenide diodes by using either thin structures or well structures. The second technique appears to be more reproducible. Continued work with epitaxial material indicates that the quality is still variable. While a small number of good devices were fabricated in the 8-18 v range, they were not generally superior to the non-epitaxial units and were produced with a small yield. Thermal resistance measurements indicate that the allowable power dissipation with adequate heat sinks for devices fabricated using 0.07 - 0.09 ohm-cm material is in excess of one watt per pf junction capacitance at zero bias. (Author)

AD-296 002 Div. 8, 25
(TISTE/CRJ) OTS price $26.00

New York U., N. Y.
PROCEEDINGS OF THE SEVENTH SYMPOSIUM ON HYDROGEN THYRATRONS AND MODULATORS HELD AT THE HEXAGON, FORT MONMOUTH, NEW JERSEY ON 22, 23 AND 24 MAY 1962.
1962, 573p. incl. illus. tables, refs.
(Contract DA 36-039-sc-89076)
Unclassified report

DESCRIPTORS: *Thyratrons, *Modulators, *Symposia, Hydrogen, Cathodes, (Electron tubes), Ceramic materials, Pulse generators, Magnetic modulators, Traveling wave tubes, Diodes (Semiconductor), Trigger circuits, Field emission, Pulse modulation, Radar equipment, Microwave equipment, Electronic switches, Deuterium, Electron accelerators, Solid state physics.

AD-296 025 Div. 8
(TISTE/CRJ) OTS price $7.60

HRB-Singer, Inc., State College, Pa.
COMPREHENSIVE BIBLIOGRAPHY ON PARAMETRIC AMPLIFIERS,
comp. by B. B. Palluconi. 4 Dec 62, 73p.
Unclassified report

DESCRIPTORS: *Parametric amplifiers, *Bibliographies.

AD-296 029 Div. 8, 7
(TISTE/CRJ) OTS price $1.60

Oak Mfg. Co., Crystal Lake, Ill.
MINIATURE ROTARY PANEL SEALED SWITCH.
Quarterly progress rept. no. 9, 13 May-12 Aug 62,
by Howard Olson. 22 Jan 63, 8p.
(Contract DA 36-039-sc-81297)
Unclassified report

DESCRIPTORS: *Rotary switches, *Electric switches, *Reliability (Electronics), Miniature electrical equipment, Miniature electronic equipment, Life expectancy, Production.

AD-296 122 Div. 8
(TISTE/OHD) OTS price $10.50

Institute of Tech., U. of Minn., Minneapolis.
STUDY OF NOISE IN SEMICONDUCTORS AND SEMICONDUCTOR DEVICES.
Final rept., Vol. 2, 1 Jan 61-31 July 62 on Task 2,

by A. van der Ziel. 31 July 62, 131p. incl. illus. tables.
(Contract DA 36-039-sc-85374, Proj. 3A99-21-001)
Unclassified report

DESCRIPTORS: *Diodes (Semiconductor), *Crystal mixers, *Noise (Radio), Ultrahigh frequency, Mathematical analysis, Circuits, Fourier analysis, Electrical conductance, Feedback amplifiers, Correlation techniques, Negative resistance circuits.

AD-296 123 Div. 8
(TISTE/CRJ) OTS price $4.60

Little, Arthur D., Inc., Cambridge, Mass.
METHODS FOR LOW POWER TEMPERATURE CONTROL.
Quarterly rept. no. 1, 2 July-30 Sep 62,
by Igor A. Black. 30 Sep 62, 38p. incl. illus.
(Rept. no. 1)
(Contract DA 36-039-sc-90883, Proj. 3B55-03-003-72)
Unclassified report

DESCRIPTORS: *Quartz, *Crystal ovens, Thermostats, Stability, Temperature, Degasification, Thermal insulation, Switching circuits, Miniature electronic equipment, Temperature control.

An investigation is conducted of methods and devices by which the temperature of a single quartz crystal blank can be maintained at a nominal operating temperature over environmental temperature extremes. Four types of snap-action ovens are studied: a 500-milliwatt oven (Type E6) requiring accessibility to the crystal and operating at +75 C ± 2.5 C over a -40 to +60 C ambient; a 50-mw sealed oven (Type F6G) with similar operating requirements; a less-costly, 100-mw sealed oven (Type G6G) with similar operating requirements; and a 250-mw oven (Type H6) requiring accessibility to a temperature-compensated crystal and operating at 0 C ± 3 C over a -55 to 0 C ambient. Components for all four types were chosen, pilot models were designed, and a test program was formulated to produce data on the performance of each component. Tests were begun on pilot models of E6 and H6 ovens to establish performance limits on snap-action thermostats. Thermocouple instrumentation was used in determining temperature of dummy crystals. Tests were completed satisfactorily on the E6 pilot models, and fabrication of the required five final models has begun. Chambers for determining outgassing properties of components for the sealed (F6G and G6G) ovens were made, and tests are in progress. (Author)

AD-296 129 Div. 8
(TISTA/GEC) OTS price $1.10

Aeronautical Electronic and Electrical Lab., Naval Air Development Center, Johnsville, Pa.
EVALUATION OF DEVELOPMENTAL HIGH TEMPERATURE PULSE FORMING NETWORK, Z-2922 MANUFACTURED BY SPRAGUE ELECTRIC COMPANY NORTH ADAMS, MASSACHUSETTS.
16 Jan 63, 4p. (Rept. no. NADC-EL-L6285)
Unclassified report

DESCRIPTORS: *Pulse generators, *Waveform generators, High temperature research, Microwave networks.

An evaluation was made of a developmental, high temperature, pulse-forming network Z-2922, a pulse-forming network capable of continuous operation at ambient temperatures between -55 and +150 C. The network uses a fluorinated hydrocarbon fluid as a dielectric fluid. This fluid contains no hydrogen and does not evolve explosive gases under sustained arcing or conditions of high electrical stress. The dielectric of the capacitors in the network is mica paper. (Author)

AD-296 172 Div. 8, 14
(TISTE/OHD) OTS price $1.60

General Electric Co., Schenectady, N. Y.
INVESTIGATION OF VARIOUS ACTIVATOR REFRACTORY SUBSTRATE COMBINATIONS,
by J. H. Affleck and W. T. Boyd. 27 Dec 62, 11p. incl. illus. 18 refs. (Scientific rept. no. 4)
(Contract AF 19(628)279, Proj. 4619)
(AFCRL 63-11) Unclassified report

DESCRIPTORS: *Cathodes (Electron tubes), *Thermionic emission, *Electron tubes, Barium compounds, Work functions, Vacuum apparatus, Impurities, Test sets, Test equipment (Electronics), Refractory materials.

AD-296 181 Div. 8, 25
(TISTE/OHD) OTS price $1.60

Stanford Research Inst., Menlo Park, Calif.
TUNNEL CATHODES FOR MICROWAVE TUBES.
Appendix to Interim rept. no. 1,
by D. V. Geppert. Dec 62, 12p. incl. illus. table (Appendix to AD-285 194)
(Contract AF 33(657)8721)
Unclassified report

DESCRIPTORS: *Cathodes (Electron tubes), *Solid state physics, Metals, Electron transitions, Theory, Niobium compounds, Oxides, Electric currents, Electric potential, Work functions, Thin films (Storage devices), Dielectric films, Temperature.

AD-296 183 Div. 8, 14
(TISTM/BRW) OTS price $4.60

Airtron, Inc., Morris Plains, N. J.
DEVELOPMENT OF A FERRITE MATERIAL FOR A HIGH POWER PHASE SHIFTER AT S-BAND.
Interim development rept. no. 3, 18 Oct 62-18 Jan 63.
4 Feb 63, 46p. incl. illus. tables (Rept. no. R11-410)
(Contract NObsr-87388)
Unclassified report

DESCRIPTORS: *Phase shifters, *Ferrites, Ferromagnetic materials, Processing, Ceramic materials, Flame spraying, S band, Manufacturing methods.

The composition NAGS-4, ($Ni_{0.98}Mn_{0.02}Al_{0.728}Ga_{0.248}Fe_{0.93}O_4$), was selected as the composition coming closest to the original specification for a S-band phase shift device and will be used to study the effect of ceramic processing on the ceramic and magnetic properties. Samples have been prepared with a 4 pi M sub s of 600 g, a Curie temperature of 198 C and a tan delta of 0.002. A theory was proposed for the high saturation magnetization obtained when the porosity of the sample was less than 5%. It has been shown that ferrites in the nickel aluminum gallium system can be flame sprayed and sintered and have properties very close to equivalent compositions prepared by conventional ceramic techniques. Some of the discrepancies in properties of the flame sprayed material are attributed to compositional changes. (Author)

Division 8 - ELECTRONICS AND ELECTRONIC EQUIPMENT

AD-296 197 Div. 8, 25
(TISTE/CAM) OTS price $1.60

General Electric Co., Syracuse, N. Y.
SEMICONDUCTOR DEVICE CONCEPTS.
30 Nov 62, 10p. 5 refs. (Scientific rept. no. 2B)
(Contract AF 19(628)329, Proj. 4608)
(AFCRL 63-20(B)) Unclassified report

DESCRIPTORS: *Diodes (Semiconductor), *Semiconductor devices, *Lasers, Crystals, Gallium compounds, Arsenides, Luminescence, Electrical properties, Light transmission, Diffusion, Impurities, Phosphorus.

Generation of coherent visible radiation in Ga(As1-xPx) p-n junctions is described. The conditions for generation of coherent visible radiation, the possibilities of wavelength selection, and the extension to and implications of p-n junction lasers in ternary compounds are presented. The electrical properties of Ga(As1-xPx) p-n junctions and their considerable potential for use as avalanche and forward regulator diodes, signal diodes, parametric diodes, and stored charge diodes are described. (Author)

AD-296 217 Div. 8, 15
(TISTW/RD) OTS price $6.60

Stanford Research Inst., Menlo Park, Calif.
COUPLED MODE THEORY FOR ADVANCED MICROWAVE DEVICES.
Interim rept. no. 3,
by M. C. Pease. Jan 63, 60p. 7 refs.
(Contract AF 33(657)8343)
Unclassified report

DESCRIPTORS: *Microwave equipment, *Microwave networks, Matrix algebra, Differential equations, Groups (Mathematics), Functional analysis, Taylor's series, Transmission lines, Microwaves, Propagation, Theory, Mathematical analysis.

A generalized theory of coupled modes of propagation is applied to the study of interactions in distributed microwave devices. Methods are developed for the application of group theoretic techniques to conservative linear systems that may or may not be uniform. It is shown that transmission matrices that solve a particular problem do, in fact, form a group. This group is a continuous (Lie) group and can be characterized by its infinitesimal transformations. Whether or not a given system is reducible in the group theoretic sense was investigated. Non-uniform systems such that the derivative of the system operator is expressible as a commutator of the system operator with another matrix was studied. It was shown that such a system is explicitly soluble if a matrix can be chosen to be constant. That this is a special case of a more general class of explicitly souble non-uniform systems is indicated. It was shown that the matrix describes the behavior of the eigen-vectors of the system operator. An explicit form for the matrix is obtained and some of its properties are developed. (Author)

AD-296 219 Div. 8
(TISTW/RD) OTS price $6.60

Microwave Research Inst., Polytechnic Inst. of Brooklyn, N. Y.
PRINCIPLES OF DESIGNING DISTRIBUTED NETWORKS,
by Nobuichi Ikeno, tr. by Akio Matsumoto.
10 Oct 62, 58p. incl. illus. table, 23 refs.
(Rept. no. PIBMRI-1003-62; Trans. from Design of Distributed Constant Networks 4:3, July 55)
(Contract AF 30(602)2213, Proj. 8505)
(RADC TDR 62-437)
Unclassified report

DESCRIPTORS: *Electric networks, Networks, Transmission lines, Admittance, Polynomials, Design, Mathematical analysis.

The synthesis of distributed networks is described with prescribed characteristics along with the method of approximation of their characteristics. The networks consist only of cascade and parallel connections of distributed elements of equal lengths. In such networks with elements of equal lengths, similar treatment as in lumped networks would be possible with lambda = j tan(Pi f/2 f sub o) as a variable. But here some special features are encountered with, which are very different from those in lumped networks; i.e., lambda = ±1 will be transmission zeros. As for network configuration, use of close-coupled coils and series elements should be avoided. In spite of such restrictions on construction, an important conclusion was obtained, that a transmission function is always realizable which has transmission zeros only on the imaginary axis and at ±1 on the complex lambda- plane. The proof is presented, accompanied by the manners of construction, approximation of a characteristic with functions having poles at lambda = ±1, especially procedures to obtain Tchebycheff characteristics and several design examples. Some citation is also made on the construction of 2-terminal distributed networks. (Author)

AD-296 228 Div. 8, 25
(TISTP/MB) OTS price $4.60

Microwave Research Inst., Polytechnic Inst. of Brooklyn, N. Y.
CANONICAL FORM OF TWO TANDEM-CONNECTED FOUR-PORTS,
by Allan L. Reynolds. June 63, 44p. incl. illus. tables, 5 refs. (Research rept. no. PIBMRI-1092-62)
(Grant AFOSR 62-295)
Unclassified report

DESCRIPTORS: *Transmission lines, *Microwave networks, Matrix algebra, Coupling circuits, Theory, Mathematical analysis.

Under the rather general conditions it is possible to represent a 4-port by means of an ideal directional-coupler together with certain 2-ports in each of its lines. Such a representation is called the 'canonical-form' of the given 4-port. The canonical-form of two tandem-connected 4-ports and the coupling coefficient of the associated ideal directional coupler are determined. The presentation is of a theoretical nature. (Author)

AD-296 293 Div. 8
(TISTA/FRL) OTS price $1.10

General Electric Co., Utica, N. Y.
QRC-139A AEROSPACE GROUND EQUIPMENT (AGE).
Monthly progress rept. no. 11, 8 Jan-11 Feb 63.
11 Feb 63, 8p.
(Contract AF 33(604)39443)
Unclassified report

DESCRIPTORS: *Radiofrequency spectroscopy, Frequency converters, L band, S band, Tests, Design, Circuits, Ground support equipment, X band, Spectrum analyzers.

The design and development is described of a Broadband Spectrum Analyzer, Converter-Measuring, Frequency 'S', and Converter-Measuring, Frequency 'L'. Additional work is being accomplished on Converter-Measuring, Frequency 'X'. (Author)

AD-296 315 Div. 8, 26
(TISTE/CAM) OTS price $5.60

Pacific Semiconductors, Inc., Lawndale, Calif.
PRODUCTION ENGINEERING MEASURE. TRANSISTOR, VHF, SILICON, POWER (75W).
Quarterly rept. no. 1, 1 July-30 Sep 62,
by R. N. Clarke, W. M. Wilson and R. C. Neville. 30 Sep 62, 49p. incl. illus. tables (Rept. no. 3000:47-Q-1)
(Contract DA 36-039-sc-86733)
Unclassified report

DESCRIPTORS: *Transistors, *Manufacturing methods, Transistor amplifiers, Radiofrequency oscillators, Silicon, Industrial production, Processing, Management engineering, Quality control, Packaged circuits, Test equipment (Electronics), Tables, Very high frequency.

Device design analysis, process improvements, and investigation of new contact techniques were the major areas of activity. Additional work was initiated in package analysis and package limitations. Test circuits were designed for initial amplifier and oscillator testing and equipment for group A evaluation was provided. The thermal path between crystal and stud was under intensive investigation and significant improvement was noted. The present processes were reviewed, and diffusion photoresist and assembly area improvements and experiments were initiated. (Author)

AD-296 320 Div. 8, 6, 30
(TISTW/PCR) OTS price $3.60

Rome Air Development Center, Griffiss Air Force Base, N. Y.
FLOW CALORIMETERS FOR THE 4-MM AND 2-MM WAVELENGTH RANGE,
by Vincent C. Kapfer. Dec 62, 27p. incl. illus. tables, 7 refs. (Rept. no. RADC TDR 62-600)
(Proj. 5578)
Unclassified report

DESCRIPTORS: *Calorimeters, Attenuators, Thermoelectricity, Calibration, Radiofrequency, Thermocouples, Waveguides, Standing wave ratios, Flowmeters, Power, Heat, Photographs, Pictures, Microwave equipment.

Present commercial calorimeters operating at wavelengths below four millimeters are limited to the measurement of a maximum of one-half watt of average power, thus requiring the use of precision calibrated attenuators for higher powers. This report describes the mechanical and electrical characteristics of a 4-millimeter (50 to 75 kmc/s) and a 2-millimeter (90 to 140 kmc/s) flow calorimeter capable of measuring several watts of average power. These calorimeters have an advantage over commercially available units by being capable of direct power measurements from one milliwattt to several watts without the use of auxiliary components. (Author)

AD-296 356 Div. 8, 14, 32
(TISTM/SJR) OTS price $2.60

Lockheed Aircraft Corp., Sunnyvale, Calif.
INSPECTING AND TESTING OF EMBEDDING MATERIALS AND COMPONENTS OF ELECTRICAL MODULES BEFORE, DURING AND AFTER ASSEMBLY: A PARTIALLY ANNOTATED BIBLIOGRAPHY.
Bibliography for 1950-June 62,
comp. by Charlie M. Pierce. Nov 62, 25p. refs. (Special bibliography no. SB-62-43; Rept. no. 3-80-62-28)
Unclassified report

DESCRIPTORS: *Embedding substances, *Encapsulation, Bibliography, Sealing compounds, Effectiveness, Contamination, Microorganisms, Space craft, Epoxy plastics, Resistance (Electrical), Non-destructive testing, Test methods, Transistors, Stresses, Plastics, Isocyanate plastics, Aging (Materials), Degradation, Thermal stresses, Strain gages, Measuring devices (Electrical & Electronic), Printed circuits, Polarographic analysis, Radiography, Welds, Electron microscopy, Ultrasonic radiation, Electronic equipment.

AD-296 363 Div. 8, 26
(TISTE/OHD) OTS price $3.60

Valpey Crystal Corp., Holliston, Mass.
QUARTZ CRYSTAL UNIT CR-(XM-37)/U.
Quarterly progress rept. no. 4, 1 Apr-30 June 62, by Norman R. Gillin. 30 June 62, 32p.
(Contract DA 36-039-sc-85972)
Unclassified report

DESCRIPTORS: *Quartz resonators, *Manufacturing methods, Grinders, Quality control, Very high frequency, Production, Electronic equipment, Electrical properties, Resistance (Electrical), Interferometers, Plating, Capacitance.

Research was continued on a method of manufacturing acceptable quartz crystal units. Designs for 7th overtone crystals from 150 mc to 200 mc are given. Results obtained using these designs are given. Problems encountered during final polish are discussed. (Author)

AD-296 364 Div. 8
(TISTW/RD) OTS price $4.60

TRG, Inc., Palo Alto, Calif.
A STUDY OF THE WIRE-GRID LENS,
by M. G. Anreasen, July 62, 42p. incl. illus. 5 refs. (TRG-West Project W-101 TDR no. 1)
(Contract AF 30(602)2742)
(RADC TDR 62-363) Unclassified report

DESCRIPTORS: *Lens antennas, *Electromagnetic lenses, *Antennas, Refractive index, Mathematical analysis, High frequency, Direction finding.

A study is presented of some of the problems that are of importance in the design of a wire-grid lens of the circularly symmetric type. The first problem investigated is that of a double-wire square-mesh grid which will very often be used near the rim of the lens to keep the grid-to-grid spacing suitably small. Design formulas for the quasi-static equivalent dielectric constant of such grids have been derived. The validty of these formulas was tested experimentally. Another problem that was investigated is that of synthesizing the index of refraction in a circularly symmetric lens when the index of refraction is specified in part of the lens and when it is required that the rays leaving the lens must form a collimated beam in as large an aperture as possible. Design formulas representing the solution of this problem have been derived. These formulas are most useful for wire-grid lens designs because the grid-to-grid spacing in the outer part of the lens is often determined by mechanical considerations rather than by electrical considerations. (Author)

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AD-296 368 Div. 8
(TISTE/OHD) OTS price $3.60

RAND Corp., Santa Monica, Calif.
ANTENNA PATTERN DISTRIBUTIONS FROM RANDOM ARRAYS,
by Thomas M. Cover. Jan 63, 31p. incl. illus. 12 refs. (Memo. RM-3502-PR)
(Contract AF 49(638)700, Proj. RAND)
Unclassified report

DESCRIPTORS: *Antenna radiation patterns, *Antennas, Probability, Electromagnetic fields, Scattering, Correlation techniques, Propagation, Statistical processes, Mathematical analysis.

Research concerns the determination of the probability distribution of the electric field resulting from an arbitrary random array of sources (or scatterers). The distribution is surprisingly simple, is easily calculated for most interesting array distributions, and has wide generality of application. Specifically, we find the antenna pattern distribution of a synthetic aperture antenna formed by a moving space vehicle emitting pulses randomly in time. However, the results apply not only to synthetic aperture antennas of arbitrary distribution but also to randomly deleted antennas and to chaff, meteor trail, and electron cloud diagnostics as well. The problem is restricted to the study of the far field from n sources, the positions of which are independent identically distributed as F(r) Markov's method is then used to analyze what is essentially a two-dimensional random walk induced by a three-dimensional distribution. It is shown that if the Fourier transform psi(k) of the distribution function F(r) can be performed in closed form, then the limiting form of the probability density of the resultant electric field vector is immediately obvious for every frequency and direction of propagation. Finally, the probability density of the resultant power or envelope is determined in closed form, and the correlation between the resultant field at different angles and frequencies is exhibited. (Author)

AD-296 369 Div. 8
(TISTE/OHD) OTS price $9.10

David Sarnoff Research Center, Princeton, N. J.
RESEARCH IN ELECTRON EMISSION FROM SEMICONDUCTORS.
Final rept., 1 Oct 60-30 Sep 62,
by R. E. Simon, E. K. Gatchell and others.
30 Sep 62, 99p. incl. illus. tables, refs.
(Rept. no. 16)
(Contract DA 36-039-sc-87388, Proj. 3A99-13-001-01)
Unclassified report

DESCRIPTORS: *Semiconductors, *Thermionic emission, Electron transitions, Electric fields, Cathodes, Field emission, Cesium, Silicon, Analysis, Semiconducting films, Diffusion, Solid state physics, Injection, Heat treatment, Argon, Ion bombardment, Manufacturing methods, Photoelectric effect, Measurement.

These studies of hot electron emission from semiconductors include a review of the literature on hot electron effects in semiconductors and the theoretical study of electron-electron interactions in semiconductors and metals. The requirements for a p-n junction hot electron emitter are discussed, and a method of preparation of these emitters of silicon and studies of their properties are described. An emitter with an injection contact is described but emission measurements of this device have not been made. Attempts to clean silicon in vacuum by low temperature heating and by argon bombardment without annealing are discussed. Measurements on the interaction of cesium with silicon are reported. While it has not yet been possible to produce an emitter with optimum properties, the groundwork for such an emitter has been laid. (Author)

AD-296 370 Div. 8, 25
(TISTE/OHD) OTS price $8.10

General Electric Co., Schenectady, N. Y.
SEMICONDUCTOR DEVICE CONCEPTS.
30 Nov 62, 87p. incl. illus. tables, refs.
(Scientific rept. no. 2A)
(Contract AF 19(628)329, Proj. 4608)
(AFCRL 63-20(A)) Unclassified report

DESCRIPTORS: *Diodes (Semiconductor), Hydrostatic pressure, Germanium, Cryogenics, Stresses, Antimony, Mathematical analysis, Statistical analysis, Indium, Quantum statistics, Theory, Zinc compounds, Selenides, Tellurides, Hall effect, Solid state physics.

The effects of uniaxial compression and of hydrostatic pressure on the direct and indirect tunneling processes in germanium tunnel diodes were studied experimentally under forward and reverse bias at 4.2 K and compared with Kane's theory. The diodes were formed by alloying indium doped with 3/8 weight per cent gallium on (100) and (110) faces of germanium bars containing an antimony concentration of 5.5 x 10 to the 18th cub. cm. The first order change of the tunneling current with stress was measured at fixed bias voltages. Electrical transport measurement was made on p-type ZnTe and n-type ZnSe. In ZnTe crystals doping with Cu, Ag and Au produces acceptor levels at 0.15, 0.11, and 0.22 ev respectively. An acceptor with an ionization energy of 0.048 ev was found in the undoped crystals and is identified as the first charge state of the Zn-vacancy. The scattering mechanisms limiting the lattice mobilities of both materials were considered. It was found that the polar interaction with the longitudinal optical phonons dominates the scattering of electrons in ZnSe. Luminescence from p-n junctions constructed from the mixed crystal GaAs1-xPx and from GaSb was studied. Attempts to produce coherent radiation from these junctions has thus far been unsuccessful. (Author)

AD-296 377 Div. 8, 26
(TISTE/OHD) OTS price $8.60

RCA Industrial Tube Products, Lancaster, Pa.
PRODUCTION ENGINEERING MEASURE TUBE TYPES 7801 AND 6884.
Final rept. for 1 July 60-31 Dec 62,
by Ben Sheren. 30 Jan 63, 88p. incl. illus. tables.
(Contract DA 36-039-sc-85947)
Unclassified report

DESCRIPTORS: *Electron tubes, *Production, Electrodes, Brazing, Electron tube heaters, Cathodes (Electron tubes), Nickel, Plating, Molybdenum, Metal films, Spark machining, Broaches, Explosive forming, Ceramic materials, Vacuum apparatus, Manufacturing methods.

AD-296 410 Div. 8
(TISTE/OHD) OTS price $1.60

Watkins-Johnson Co., Palo Alto, Calif.
DEVELOPMENT OF S-BAND LOW-NOISE PERIODIC PERMANENT MAGNET TRAVELING-WAVE TUBE.

by B. P. Israelsen. 20 Dec 62, 12p. incl. illus. 1 ref. (Rept. no. W-J 62-604R3)
(Contract AF 30(602)2694, Proj. 4506)
(RADC TDR 63-6) Unclassified report

DESCRIPTORS: *Traveling-wave tubes, *Microwave amplifiers, Magnets, Noise (Radio), Ferrites, Phase distortion, Electron lenses, Electron beams, Electron guns, S band.

An additional focusing test using two ferrite stacks opposed so as to yield a reversed-field was made. Performance was only moderate, with 75 percent beam transmission being obtained at rated helix voltage. A very promising magnetic circuit configuration using a straight-field Alnico 5 magnet has been devised. The external fringing field is effectively shielded and the cathode field is peaked to about 750 gauss. Two tubes have been built with stepped-diameter gun bulbs, permitting the use of a gun stack with less than 1/2-inch diameter. One of these operated with a best noise figure of 3.1 db. A half-inch pin base has been developed, in addition to a coupler with 3/4-inch diameter. These size reductions permit the use of a small, lightweight magnet. (Author)

AD-296 414 Div. 8
(TISTE/OHD) OTS price $8.60

Philco Corp., Palo Alto, Calif.
ANALYSIS AND DESIGN OF FEEDBACK DISCRIMINATORS,
by W. R. Wood. 31 Dec 62, 1v. incl. illus. tables, refs. (Rept. no. WDL-TN62-9)
(Contract AF 04(695)113)
Unclassified report

DESCRIPTORS: *Discriminators, *Frequency modulation, Mathematical analysis, Integral transforms, Control systems, Servo amplifiers, Signal-to-noise ratio, Design, Intermediate frequency amplifiers, Transistor amplifiers, Transients, Feedback.

The analysis and design of feedback discriminators applies to both systems engineering and hardware design. The research develops a linear equivalent model, analyzes the model, examines transient response, gives thresholds, presents a design procedure, and states hardware considerations. The design procedure is illustrated by an example. (Author)

AD-296 458 Div. 8, 26
(TISTM/SJR) OTS price $3.60

Atomics International, Canoga Park, Calif.
UNIFORM WORK FUNCTION CATHODE STUDIES FOR THERMIONIC CONVERTERS.
Quarterly rept. no. 2, 12 Oct 62-12 Jan 63,
by M. N. Huberman. Jan 63, 33p. incl. illus. tables, 6 refs.
(Contract AF 33(657)8726)
Unclassified report

DESCRIPTORS: *Thermionic emission, *Cathodes, *Molybdenum, Chlorides, Fluorides, Pyrolysis, Reduction, Crystal structure, Crystal growth, X-ray diffraction analysis, Photomicrography, Metallography, Grain structures (Metallurgy), Molybdenum compounds, Mandrels, Electron microscopy, Processing, Vapor plating.

Chemical vapor deposition techniques are being studied as a possible means of producing nonplanar thermionic cathodes having a high degree of uniformity of work function. Vapor deposited molybdenum coatings have been produced by chemical reduction of molybdenum hexafluoride pyrolysis of molybdenum hexacarbonyl and pyrolysis of molybdenum pentachloride. Plating conditions were varied for each process to determine the effect of plating conditions on the preferred orientations of crystallographic planes parallel to the plating surfaces. Both (100) and (111) preferred orientations have been found for the hexafluoride reductions. The pentachloride samples have strong (100) orientations. The hexacarbonyl samples apparently are not pure molybdenum and do not have the expected molybdenum diffraction pattern. (Author)

AD-296 513 Div. 8, 9
(TISTP/TL) OTS price $1.25

Diamond Ordnance Fuze Labs., Washington, D. C.
FLUID AMPLIFICATION. 4. GAIN ANALYSIS OF THE PROPORTIONAL FLUID AMPLIFIER,
by S. J. Peperone, Silas Katz, and John M. Goto. 30 Oct 62, 56p. incl. illus. 4 refs. (DOFL rept. no. TR-1073)
(DOFL Proj. 31100)
Unclassified report

DESCRIPTORS: *Fluid flow, *Control systems, Pressure, Pneumatic systems, Hydraulic systems, Design, Theory, Measurement, Experimental data, Errors, Amplifiers, Fluid mechanics.

A theoretical analysis of signal gain using principles of fluid stream interaction is presented. This analysis is applied to predict pressure, flow, and power gains of a fluid amplifier and to determine optimum operating conditions and geometry. Comparison of theory and measurements show agreement within the experimental error. (Author)

AD-296 537 Div. 8
(TISTE/OHD) OTS price $5.60

Electrical Engineering Research Lab., U. of Illinois, Urbana.
RESEARCH STUDIES ON PROBLEMS RELATED TO ANTENNAS.
Quarterly rept. no. 1, 1 Sep-30 Nov 62.
31 Jan 63, 50p. incl. illus. refs.
(Contract AF 33(657)10474)
Unclassified report

DESCRIPTORS: *Antennas, Antenna radiation patterns, Dipole antennas, Antenna feeds, Slot antennas, Conical antennas, Spiral antennas, Helical antennas, Mathematical analysis, Lens antennas, Millimeter waves, Antenna configurations.

Contents:
Radiation from periodic structures
Log-periodic cavity backed slot antennas
Log-spiral antennas
Log-periodic magnetic current antennas
Log-periodic zigzag antennas
An integrated antenna amplifier
Collecting systems containing nonlinear and/or active elements
Wave propagation along helical conductors
Investigation of a class of periodic structures
Focusing of radiation from a bunched Cerenkov beam
Transmission between antennas when the far field approximation does not apply
Radiating lens illuminated from a Gobau beam-waveguide
Zone phase plates
Study of focusing properties of metal-lens antennas
Millimeter antenna literature

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AD-296 543 Div. 8
(TISTP/TL) OTS price $11.50

Electronic Communications, Inc., Timonium, Md.
MILLIMETER WAVE RESEARCH.
Final technical rept.,
by J. M. Cotton, F. Sobel and others. 16 Dec 62, 148p. incl. illus. tables.
(Contract AF 30(602)2457, Proj. 4506)
(RADC TDR 62-626) Unclassified report

DESCRIPTORS: *Millimeter waves, Microwave equipment, Microwave frequency, Wave transmission, Extremely high frequency, Radio transmission, Waveguides, Transmission lines, Fiber optics, Electromagnetic wave reflection, Attenuation, Optics, Propagation.

The analysis includes a study of propagation methods for possible use in the submillimeter wavelength region (1.0 to 0.1 mm) of the electromagnetic spectrum. The more promising among these (trough waveguide, oversized waveguide and Fresnel region propagation using Fresnel zone plates) are given a more comprehensive analytical treatment. Recommendations are given for some designs which would appear to have the highest probability for success. A measurement system consisting of a harmonic generator signal source and a harmonic-mixing superheterodyne receiver was built which was used for data taking at 210, 280, 350, and 420 Gc. The fundamental signals for harmonic generation and mixing were obtained from 70 Gc klystrons. An AFC system was developed to hold the frequency of the second. The theory and instrumentation of the system is presented with some data taken on standard and oversized rectangular waveguides. (Author)

AD-296 570 Div. 8
(TISTE/OHD) OTS price $2.60

Bliley Electric Co., Erie, Pa.
PRODUCTION ENGINEERING MEASURE. QUARTZ CRYSTAL UNITS CR-(XM-45)/U.
Quarterly progress rept. no. 2, 1 Aug-30 Nov 62,
by J. M. Wolfskill, A. R. Krèspan, and Robert Mouck. 30 Nov 62, 34p. incl. tables.
(Contract DA 36-039-sc-86719)
Unclassified report

DESCRIPTORS: *Crystal oscillators, *Quartz resonators, Shock resistance, Data, Vibration, Temperature, Reliability, Capacitance, Crystal holders, Crystal structure, Manufacturing methods, Low frequency.

AD-296 580 Div. 8, 30, 25
(TISTP/JW) OTS price $17.50

Research Lab. of Electronics, Mass. Inst. of Tech., Cambridge.
(No title).
Quarterly progress rept. no. 68 for period ending 15 Jan 63,
by H. J. Zimmermann, G. G. Harvey, and W. B. Davenport, Jr. 15 Jan 63, 258p. incl. illus. tables, refs.
(Contracts DA 36-039-sc-78108, AF 19(604)5992 and others)
Unclassified report

DESCRIPTORS: *Scientific research, *Physics, Microwaves, Hyperfine structure, Radio astronomy, Communication theory, X-ray diffraction analysis, Masers, Optical analysis, Infrared equipment, Acoustics, Molecular structure, Nuclear resonance, Plasma physics, Electrons, Communication systems, Neurology, Machine translation, Language, Electronics, Reports.

AD-296 770 Div. 8, 26
(TISTE/OHD) OTS price $3.60

Clevite Transistor Products, Waltham, Mass.
PRODUCTION ENGINEERING MEASURE FOR THE IMPROVEMENT OF GERMANIUM ALLOY POWER TRANSISTORS.
Quarterly progress rept. no. 2, 31 July-31 Oct 62,
by George Wallis. 31 Oct 62, 1v. incl. illus. tables.
(Contract DA 36-039-sc-86724)
Unclassified report

DESCRIPTORS: *Transistors, *Manufacturing methods, Production, Reliability, Life expectancy, Processing, Organic coatings, Cleaning, Surface properties, Oxidation, Heating, Seals (Stoppers), Tests, Germanium.

Extensive work was done on jet rinsing and experimental results are presented. Work was started on surface passivation by oxidation and experimental results are reported. Experiments on surface passivation by organic coats were started and results are given. Further work on injection alloying indicated that control over the process is exceedingly difficult. Steps were taken which will make a 100% helium leak test feasible. In addition, the possibility is being explored of baking a thin coat of silicon resin onto welded units to close up microscopic leaks. (Author)

AD-296 799 Div. 8
(TISTE/OHD) OTS price $2.60

Microwave Associates, Inc., Burlington, Mass.
DISTRIBUTED JUNCTION TUNNEL DIODE OSCILLATOR, PHASE II.
Quarterly progress rept. no. 2, 1 Sep-31 Oct 62,
by C. Howell, C. Genzabella, and R. Tenenholtz. 31 Oct 62, 17p. illus. table.
(Contract DA 36-039-sc-89163, Proj. 3A99-21-001)
Unclassified report

DESCRIPTORS: *Diodes (Semiconductor), *Microwave oscillators, Semiconductor devices, X band, Stability, Electrical impedance, Gallium compounds, Arsenides, Cavity resonators, Distribution, Capacitance, Tuning devices, Germanium, Manufacturing methods, Semiconducting films, Negative resistance circuits.

Efforts to determine the feasibility of constructing 10 mw 10 kmc tunnel diode oscillators continued and diode requirements for these oscillators were determined. Various materials, doping elements, and fabrication techniques were investigated to determine the best combination of these to potentially meet the frequency and power requirements. Three packaged and two distributed junction tunnel diode oscillators were designed and built. Using the packaged single diode oscillator, power outputs of 100 microwatts as been obtained in X-band and approximately 1/2 milliwatt at 5 - 6 kmc. Tuning problems held back use of larger capacity, larger peak current diodes which have cutoff frequencies well in excess of 10 kmc. Some circuit changes have been made to eliminate these tuning problems. Using a ring distributed tunnel diode in the distributed oscillator power outputs of 3 mw have been obtained at low frequencies. In addition, a stripline package oscillator is being built. The low impedance of this system should eliminate some of the impedance matching problems with the waveguide oscillators. (Author)

AD-296 800 Div. 8
(TISTW/PCR) OTS price $6.60

Microwave Associates, Inc., Burlington, Mass.
RUGGEDIZED MICROWAVE DUPLEXING TUBES PRODUCTION ENGINEERING MEASURES PROGRAM.
Quarterly progress rept. no. 3, 12 Sep-12 Dec 62, by Paul Basken. 12 Dec 62, 1v. incl. illus. tables.
(Contract DA 36-039-sc-85987)
Unclassified report

DESCRIPTORS: *Microwave communication systems, *Crystal filters, Design, Production, Tests, Specifications, Life expectancy, Electron tubes, Tables, High temperature research, X band.

AD-296 820 Div. 8
(TISTP/JW) OTS price $1.10

Electrical Engineering Research Lab., U. of Texas, Austin.
RESEARCH ON ELECTROMAGNETIC WAVE PROPAGATION EFFECTS IN DYNAMIC SITUATIONS.
Quarterly engineering rept. no. 3, 1 Nov 62-31 Jan 63.
31 Jan 63, 3p. illus.
(Contract AF 33(657)8716, Proj. 4062)
Unclassified report

DESCRIPTORS: *Radio signals, *Electromagnetic waves, Absorption, Emissivity, Measurement, Dynamics, Attenuation, Propagation.

AD-296 821 Div. 8
(TISTW/PCR) OTS price $8.60

Texas Instruments, Inc., Dallas.
SIGNAL CORPS SELECTED FUNCTIONAL ELECTRONIC BLOCKS.
Final rept., Phase 1 on Functional Integrated Circuits,
by Bob Reynolds and Gerald Luecke. 26 Oct 62, 88p. incl. illus. tables (Rept. no. 02-62-35)
(Contract DA 36-039-sc-78322)
Unclassified report

DESCRIPTORS: *Packaged circuits, *Semiconductor devices, Digital systems, Transistors, Gates (Circuits), Resistors, Diodes, Inverters, Computer logic, Silicon, Configurations, Tests, Test methods, Tables, Pictures, Production, Networks.

Fabrication and testing of a set of functional digital circuits in semiconductor network form which would be operationally equivalent to circuits used in Signal Corps equipment are described. The circuit required both PNP and NPN transistor structures and include both resistor-diode gates, inverters, flip-flops and an exclusive-OR logic circuit. The semiconductor networks were formed by diffusing element paths into silicon material, using both mesa and planar configurations. Circuit test procedures are outlined and performance data is tabulated. (Author)

AD-296 840 Div. 8
(TISTW/PCR) OTS price $1.60

Radiation, Inc., Palo Alto, Calif.
SUPER-POWER KLYSTRON TUBE-TEST FACILITY.
Quarterly rept. no. 8, 1 July-30 Sep 62, by Roby L. Blessing. 15 Oct 62, 18p. illus.
(Rept. no. G-108-Q8)
(Subcontract to Varian Associates, Palo Alto, Calif.)
Unclassified report

DESCRIPTORS: *Klystrons, Beams (Electromagnetic), Modulators, Magnets, Transformers, Anodes, Resistors, Coupling circuits, Cooling and ventilating equipment, Control systems, Capacitors, Power supplies, Pulse generators, Transformers, Electromagnetic pulses, Switching circuits, Test facilities.

Contents:
Beam Supply
Final Modulator (Ground Deck, Buffer Deck and Floating Deck)
Magnet Supplies
Klystron Filament Transformer
Mod-Anode Bias Supply and Associated Coupling Resistors
Cooling System
D-C Dummy Load
Control Console
Collector-Capacitor Bank
Crowbar Logic Circuits
Interim Modulator Power Supply
Interim Modulator Pulse Generator

AD-296 842 Div. 8, 26.
(TISTE/OHD) OTS price $8.60

Western Electric Co., Laureldale, Pa.
MECHANIZATION OF SEMICONDUCTOR DEVICES 2N560, 2N1051, 2N1072, 2N1195, 1N664, 1N665, 1N666, 1N667, 1N668, 1N669, 1N673, 1N675, 1N697, 1N701, AND 1N810.
Quarterly progress rept. no. 13, 26 June-26 Sep 62,
by M. N. Reppert. 26 Sep 62, 89p. incl. illus.
(Contract DA 36-039-sc-81294)
Unclassified report

DESCRIPTORS: *Semiconductor devices, *Manufacturing methods, Machines, Diodes (Semiconductor), Transistors, Automation, Test sets, Containers, Production.

A review of the progress made in mechanizing the manufacture of 2N560, 2N1051, 2N1072 and 2N1195 transistors and of .4 watt diodes for Nike Zeus. Status of this production engineering measure is shown by listing the number of machines in a given developmental phase. Status of each of the 34 machines is determined by the developmental phase of its major components unless a delinquent component hinders progress. The status of both transistor and diode mechanization programs is given by grouping machines of like status. Detailed reports on each incomplete machine are described. (Author)

AD-296 845 Div. 8
(TISTP/WH) OTS price $10.10

National Research Council, Washington, D. C.
REPORT OF THE AD HOC PANEL ON ELECTROMAGNETIC PROPAGATION.
Final rept.,
Feb 63, 119p. incl. illus. tables, 12 refs.
(Contract AF 18(600)1895)
Unclassified report

DESCRIPTORS: *Radio waves, *Propagation, *Radar tracking, *Errors, Ranges (Distance), Atmosphere, Ionosphere, Periodic variations, Atmospheric refraction, Electromagnetic waves, Guided missiles, Radar signals.

AD-296 863 Div. 8, 30, 15
(TISTP/JW) OTS price $1.60

Army Missile Command, Redstone Arsenal, Huntsville, Ala.
THEORETICAL ANALYSIS OF A TYPICAL SAMPLED-DATA SYSTEM,

by H. R. McCarley. 21 Jan 62, 12p. incl. illus.
(Rept. no. RG-TR-63-5)
Unclassified report

DESCRIPTORS: *Servomechanisms, *Training devices, Measurement, Data, Mathematical analysis, Analog computers, Stability, Simulation, Sampling, Analysis.

Closed loop servomechanisms are usually linear feedback systems operating on continuous signals. There is, however, a distinct class of servomechanisms which operates on ''sampled data.'' The input, or actuating signal, is represented by samples at regular intervals of time with information carried in the amplitude by samples The analysis of sampled data systems presents several features quite different from those found in continuous systems. The error is measured, correction applied, and system passes through a waiting period before the next error measurement. This results in a tendency to over correct for the accumulated error. This report presents a mathematical stability analysis of a typical sample data servo using the Z transform and root locus. The system was simulated on a Donner 3200 analog computer and the results from this simulation were used to verify the calculated results. (Author)

AD-296 882 Div. 8
(TISTE/OHD) OTS price $2.60

General Electric Co., Syracuse, N. Y.
PRODUCTION ENGINEERING MEASURE ON HIGH PERVEANCE CATHODE-RAY TUBES.
Quarterly progress rept. no. 6, 9 Sep-8 Dec 62, by Edward T. Rate. 8 Dec 62, 23p. incl. illus. table.
(Contract DA 36-039-sc-85965)
Unclassified report

DESCRIPTORS: *Cathode ray tubes, *Electron lenses, Cathodes (Electron tubes), Thermionic emission, Electron guns, Manufacturing methods, Electron beams.

Research continued on the production engineering measure of high perveance cathode-ray tubes. After attempts to reduce the wide beam angle inherent in the focus reflex modulation structure were unsuccessful, the wide beam angle problem was circumvented with the development of an electrostatic lens utilizing the spiral optics technique. After experimental results on the device proved successful, the construction of engineering samples was begun. (Author)

AD-296 887 Div. 8
(TISTW/RD) OTS price $4.60

Weston Instruments Div., Daystrom, Inc., Newark, N. J.
PRODUCTION FACILITIES FOR MULTI-TURN METAL-FILM TRIMMER RESISTORS PER SIGNAL CORPS TECHNICAL REQUIREMENTS.
Quarterly progress rept. no. 2, 1 Oct-31 Dec 62. 31 Dec 62, 45p. incl. illus.
(Contract DA 36-039-sc-86734)
Unclassified report

DESCRIPTORS: *Variable resistors, Test equipment, Tool kits, Metal films, Manufacturing methods, Quality control, Ceramic materials, Production.

Assembly and production tooling has proceeded to the point of completion with minor exceptions. All of the preproduction component parts have been received and subjected to incoming quality inspection. These component parts have been assembled into various sub-assemblies using the assembly tooling, and changes improving component quality and facilitating assembly have been proposed. Arrangements have been made with our Quality Acceptance Group to perform the necessary qualification tests; and as an alternative, we have discussed these tests with a Government Approved outside testing company and have received a quotation. The Quality Acceptance Group will also arrange to perform certain acceptance tests requiring unique environmental conditions. A study of the required acceptance tests has been completed and a testing procedure devised. These test procedures have been discussed with our Laboratory Engineering Group and the required test apparatus was decided upon. Work on the test apparatus has advanced to 33 percent completion and prototype test equipment is being received by Product Engineering. (Author)

AD-296 890 Div. 8, 14, 26
(TISTM/ODN) OTS price $1.60

Crocker, Burbank and Co., Assn., Fitchburg, Mass.
PRODUCTION ENGINEERING MEASURE ON CAPACITOR PAPER.
Quarterly rept. no. 6, 23 Sep-23 Dec 62, by C. E. Cashman and J. D. Stacy. 23 Dec 62, 8p. incl. table.
(Contract DA 36-039-sc-85970)
Unclassified report

DESCRIPTORS: *Paper capacitors, *Paper, Tests, Manufacturing methods, Capacitance, Dielectric properties, Chlorides, pH, Electrical properties, Metals, Calcium, Copper, Iron, Magnesium, Manganese, Potassium, Sodium, Strontium, Chemical analysis, Quantitative analysis, Materials, Capacitors.

In order to confirm the apparently significant improvement in operational reliability of MIL-C-25C test capacitors attained by means of pH control in the papermaking process, particularly in paper lot USA-8, two additional capacitor tissue lots have been manufactured. These were designed to duplicate the characteristics of USA-8 and USA-9, in order to determine the reproducibility of the improvement obtained therein. As a control, a third capacitor tissue lot representing standard manufacturing practice was made simultaneously for comparison. These three new lots are identified as USA-12, USA-13, and USA-14. Analytical data covering the above three capacitor tissue lots are presented, including quantitative flame photometric analysis for metallic elements, chloride content, and pH value. Twelve military test capacitors were fabricated from each of said three capacitor tissue lots. They were subjected to initial electrical tests for dielectric strength, capacitance range, dissipation factor, and insulation resistance. They are currently being subjected to 1000-hour operational life test at 560 volts DC and 125 C. (Author)

AD-296 900 Div. 8
(TISTW/RD) OTS price $3.60

Melabs., Palo Alto, Calif.
FERRITE DEVICES FOR RECEIVING SYSTEMS.
Quarterly progress rept. no. 3, 15 Aug-14 Nov 62, by V. E. Dunn. 14 Nov 62, 28p. incl. illus. 10 refs.
(Contract DA 36-039-sc-88949)
Unclassified report

DESCRIPTORS: *Ferrites, *Waveguides, Transmission lines, Millimeter waves, Phase shifters, Aluminum compounds, Oxides, Radio receivers, Extremely high frequency.

Measurements have been made on a resonance isolator configuration utilizing large ferrite rings on the outside of a ceramic cylinder. One such isolator provided a peak isolation of around 15 db with a forward insertion loss of 2 to 2.5 db. Exploratory measurements have been made on a 4 port junction in circular waveguide. The waveguides were filled with a high dielectric constant material (alumina) to make the junction behave optically. Rexolite quarter-wavelength transformers, on the basis of preliminary tests, seem to provide satisfactory transitions in and out of the alumina. With no reflector in the junction the straight through insertion loss, including the loss of the air-alumina transitions appears to be less than 1 db. With a conducting sheet across the junction to form an elbow the insertion loss is less than 1.5 db with very little degradation of mode purity. (Author)

AD-296 901 Div. 8
(TISTW/RD) OTS price $3.60

Electron Physics Lab., U. of Michigan, Ann Arbor.
RESEARCH AND DEVELOPMENT ON HIGH-POWER CRESTATRONS FOR THE 100-300 MC FREQUENCY RANGE.
Quarterly progress rept. no. 10, 1 Oct 62-1 Jan 63,
by J. E. Boers and G. T. Konrad. Jan 63, 28p. incl. illus. tables (Rept. no. 03783-11-P)
(Contract NObsr-81403, Proj. SF-0100201)
Unclassified report

DESCRIPTORS: *Traveling wave tubes, Focusing, Electron guns, Electron beams, Cermets, Digital computers, Helixes, Particle trajectories, Electrostatics, Spectrum analyzers, Radiofrequency, Radiofrequency amplifiers, Amplifiers, High frequency.

Data on the electrostatic focusing system mounted in a beam analyzer is presented. For the voltages employed in the tests quite good transmission through the focusing structure has been observed. In addition rather complete data in the form of trajectory plots obtained from a digital computer program for the hollow-beam gun as well as the focusing system are presented. The hollow electron beam is shown to be focused quite well throughout the system. Work on the 100-300 mc metal-ceramic Crestatron is described. Some of the cold-test data obtained somewhat modifies the original calculations, but does not necessitate any design changes. The present status of tube construction is given. (Author)

AD-296 905 Div. 8
(TISTE/CAM) OTS price $3.60

Melpar, Inc., Falls Church, Va.
INVESTIGATION OF THE FRESNEL REGION OF A CASSEGRAIN ANTENNA.
Technical note on Long Range Communications Interference Study,
by Dougal W. S. Prins. Feb 63, 30p. incl. illus. 11 refs.
(Contract AF 30(602)2528)
(RADC TDR 62-360, vol. 2)
Unclassified report

DESCRIPTORS: *Coupled antennas, *Parabolic antennas, Antenna radiation patterns, Theory, Antenna lobes, Satellite networks, Superhigh frequency, Extremely high frequency, Integrals, Antenna configurations, Electromagnetic fields, Radio interference.

Described is a theoretical and experimental investigation of the electromagnetic field in the fresnel region of a cassegrain antenna having structural and operating characteristics modeled to correspond with those proposed for the antennas to be used in the satellite communication system. In the experimental program, power patterns were taken at various distances in the fresnel region and near zone of a scale model cassegrain antenna. The theoretical investigation compares the expressions derived with the experimental data, and presents an interpretation of the results as a tool for the prediction of actual patterns. The limitations of the proposed antenna system with respect to on-site interference are evaluated, and methods for reducing these defects are presented. (Author)

AD-296 929 Div. 8
(TISTE/CAM) OTS price $4.60

RCA Labs., Div., Radio Corp. of America, Princeton, N. J.
EVAPORATED THIN FILM DEVICES.
Scientific rept. no. 1, 1 June-30 Nov 62,
by P. K. Weimer, H. Borkan and others. 30 Nov 62, 42p. incl. illus. tables, 15 refs.
(Contract AF 19(628)1617, Proj. 4608)
(AFCRL 62-965) Unclassified report

DESCRIPTORS: *Transistors, *Semiconducting films, Electric insulation, Gates (Circuits), Cadmium compounds, Sulfides, Electronic switches, Capacitance, Processing, Electrodes, Crystal structure, Electrical conductance, Hall effect, Preparation, Evaporation, Electrical impedance, Mathematical analysis, Semiconductor devices.

Evidence is presented to show that the dominant current control mechanism in the insulated-gate cadmium sulfide thin film transistor (tft) is conductivity modulation in the semiconductor by field effect action of the gate. The characteristics of the coplanar-electrode tft having overlying "ohmic" contacts were demonstrated to be equivalent to the earlier staggered-electrode structure having underlying gold contacts. The measured drift mobility as calculated from the ratio of transconductance to input capacitance may be either higher or lower than the measured Hall mobility depending upon the method of preparation of the semiconductor film. An increase in the Hall mobility as a function of positive gate bias was found, contrary to predictions based upon the effect of scattering at the surface of a homogeneous semiconductor. Tests on various processing procedures and electrode contacts were carried out for cadmium sulfide and other materials potentially useful for tft fabrication.

AD-296 973 Div. 8
(TISTW/RD) OTS price $5.60

Technical Research Group, East Boston, Mass.
APPLICATION OF FRESNEL ZONE THEORY TO MICROWAVE ANTENNA DESIGN,
by Alan F. Kay. 15 Nov 62, 42p. incl. illus. table, 6 refs. (Scientific rept. no. 3)
(Contract AF 19(604)8057, Proj. 4600)
(AFCRL 62-950) Unclassified report

DESCRIPTORS: *Antennas, *Lens antennas, *Parabolic antennas, *Antenna radiation patterns, Reflectors, Microwaves, Optics, Geometry, Electromagnetic lenses, Focusing, Spheres, Microwave frequency, Optical properties, Theory.

Some fundamental formulas are derived which are corrections to geometrical optics for radiation from bounded wavefronts. These formulas apply in both the near and far field, in focal and caustic regions, and in lit, twilight, and dark zones. Applications are made to improving the gain of a spherical reflector and the analysis of (generally unwanted) focussing of spillover energy in microwave systems. (Author)

AD-296 975 Div. 8
(TISTP/MB) OTS price $3.60

Syracuse U. Research Inst., N. Y.
PROBABILISTIC NETWORK STUDY - SYSTEM RELIABILITY.
Final rept.,
by F. M. Reza. Aug 62, 43p. incl. illus. refs.
(Rept. no. EE 747-6208FR)
(Contract AF 19(604)6169, Proj. 5632)
(AFCRL 62-724) Unclassified report

DESCRIPTORS: *Reliability (Electronics), Probability, Sampling, Data transmission systems, Communication systems, Electrical networks, Synthesis, Networks, Communication theory.

The report is divided into four parts. Part I gives a formal proof for a well-known statement of Shannon. Part II presents a note on a new sampling theorem using Bernstein's orthogonal polynomials as the basis. Part III contains a new relation between positive real functions of Circuit Theory and the h(p) functions of Reliability Theory. Part IV contains merely the formulation of a new problem concerning ''nearly normal channels'' and the evaluation of their information transmission. (Author)

AD-296 989 Div. 8
(TISTP/MB) OTS price $2.60

Case Inst. of Tech., Cleveland, Ohio.
CONTINUOUSLY EQUIVALENT NETWORKS AND THEIR APPLICATION,
by James D. Schoeffler. 2 Dec 62, 24p. incl. illus. table, 11 refs. (Technical rept. no. 5)
(Contract Nonr-114110, Proj. NR-375-370)
Unclassified report

DESCRIPTORS: *Electrical networks, Filters, Amplifiers, Analysis, Differential equations, Design, Transformations (Mathematics), Synthesis.

An extension of the Cauer formulation of the equivalent network theory problem is discussed which applies the transformations directly to the element parameter matrices, thereby placing the elements of the transformed network directly in evidence. The method of steepest descent is applied to choose the arbitrary parameters of the transformation in order to derive optimal networks, that is, networks with minimum number of elements and/or minimum element distribution. (Author)

AD-296 990 Div. 8
(TISTP/MB) OTS price $2.60

Case Inst. of Tech., Cleveland, Ohio.
THE SYNTHESIS OF MINIMUM SENSITIVITY NETWORKS,
by James D. Schoeffler and A. D. Waren.
21 Jan 63, 21p. illus. 12 refs. (Technical rept. no. 6)
(Contract Nonr-114110, Proj. NR-375-370)
Unclassified report

DESCRIPTORS: *Electrical networks, Design, Sensitivity, Networks, Computers, Differential equations, Synthesis.

The synthesis of networks with minimum sensitivity to element tolerances is studied from a computer viewpoint. The theory of equivalent networks is used to generate a sequence of networks whose transfer functions are identical to that of a given network but whose elements differ from one network to the next by an incremental amount. In the limit, differential equations result whose solution at any value of the independent variable give the elements of an equivalent network. Similarly, differential equations for the sensitivity of the transfer function to changes in each of the elements are derived. The differential equations in both cases are linear homogeneous with the elements of the transformation matrix as the forcing functions. With the aid of the exponential solution to the matrix differential equation, digital computer solution even for complex networks is very straightforward and rapid. (Author)

9. FLUID MECHANICS

AD-296 103 Div. 9, 1
(TISTA/GEC) OTS price $3.60

David Taylor Model Basin, Washington, D. C.
WIND-TUNNEL INVESTIGATION OF THE USE OF WING TIP BLOWING TO REDUCE DRAG FOR TAKE-OFF AND LANDING,
by Herbert E. White. Jan 63, 33p. incl. illus. 1 ref. (Aero rept. no. 1043).
Unclassified report

DESCRIPTORS: *Wings, *Flaps, *Aerodynamic control surfaces, Aspect ratio, Model tests, Wind tunnel models, Drag, Aerodynamic characteristics, Take-off, Lift, Effectiveness, Airplane landings, Design, Jets.

AD-296 177 Div. 9
(TISTA/FRL) OTS price $3.60

Boeing Scientific Research Labs., Seattle, Wash.
A STUDY OF THE OPTIMUM TRANSVERSAL CONTOUR OF A BODY AT HYPERSONIC SPEEDS USING DIRECT METHODS,
by Angelo Miele. Dec 62, 27p. illus. 3 refs. (Document no. D1-82-0220; Flight Sciences Lab. technical rept. no. 64)
Unclassified report

Also available from the author.

DESCRIPTORS: *Conical bodies, Drag, Integral equations, Hypersonic characteristics, Aerodynamic configurations.

This paper refers to a slender conical body whose length and base area are given and considers the problem of determining the transversal contour which minimizes the over-all drag (sum of the pressure drag and the friction drag) under the assumption that the pressure coefficient satisfies Newton's impact law and that the friction coefficient is constant. Direct methods are employed, and the analysis is confined to a body whose cross section is either a regular polygon or is composed of a basic circle external to which are symmetric segments of a logarithmic spiral. (Author)

AD-296 205 Div. 9, 25
(TISTP/JW) OTS price $2.60

Space Technology Labs., Inc., Redondo Beach, Calif.
ERROR ANALYSIS OF THE LINEARIZED METHOD OF CHARACTERISTICS FOR NONEQUILIBRIUM FLOW,
by J. T. Lee, Jr. and A. G. Hammitt. 18 May 62, 22p. incl. illus. 3 refs. (Rept. no. 6130-6184-KU000)
(Contract AF 04(694)1)
(BSD TDR 62-118) Unclassified report

DESCRIPTORS: *Linear systems, *Fluid flow, Errors, Supersonic flow, Analysis, Stabilization systems.

The pressure on an infinite sinusoidal wall in steady two-dimensional supersonic flow of an inviscid gas in vibrational or chemical nonequilibrium is obtained by the linearized method of characteristics and compared to the analytical solution of the linearized equations previously obtained by Vincenti. The system of "frozen" characteristics is used. At near-equilibrium conditions the error in the method of characteristics is due entirely to the error in integrating the rate equation along the streamlines and can be made arbitrarily small by decreasing the size of the characteristic net. There appears to be no approximate criteria for reducing the error at near-equilibrium conditions by switching over to the system of equilibrium characteristics which are applicable to the entire flow field. (Author)

AD-296 232 Div. 9, 25
(TISTP/JW) OTS price $3.60

Republic Aviation Corp., Farmingdale, N. Y.
MAGNETIC FIELD EFFECTS IN THERMIONIC PLASMA DIODES.
Final technical rept.,
by Alfred Schock, William E. Eaton and others. Jan 63, 34p. incl. illus. 5 refs. (Rept. no. RAC 1102)
(Contract Nonr-328500, Proj. NR 099-350)
Unclassified report

DESCRIPTORS: *Magnetic fields, *Plasma physics, Alternating current, Generators, Modulation, Thermionic emission, Diodes.

Experiments to determine the effect of transverse and longitudinal magnetic fields on thermionic current transmission are described. The results obtained are in qualitative agreement with theoretical predictions, and suggest the possibility of using magnetic modulation for a.c. generation. (Author)

AD-296 262 Div. 9, 25
(TISTP/JW) OTS price $3.60

Aerospace Corp., Los Angeles, Calif.
HEAT DISSIPATION THROUGH DIODE LEAD WIRES UNDER STEADY-STATE CONDITIONS. SUPPLEMENT 1: HEAT DISSIPATION BY NATURAL OR FORCED CONVECTION,
by W. D. Buckman. Oct 62, 13p. incl. illus. table, 3 refs. (Suppl. no. 1 to Rept. no. TDR-930(2121)TN-1, AD-269 731)
(Contracts AF 04(647)930 and AF 04(695)169)
(DCAS TN 61-19, suppl. no. 1)
Unclassified report

DESCRIPTORS: *Heat, *Heat transfer, Wire, Copper, Fluid flow, Convection, Diodes.

AD-296 311 Div. 9, 2, 25
(TISTP/JW) OTS price $12.50

Marine Advisers, Inc., La Jolla, Calif.
THE MOTIONS OF A MOORED CONSTRUCTION-TYPE BARGE IN IRREGULAR WAVES AND THEIR INFLUENCE ON CONSTRUCTION OPERATION,
by Paul Kaplan and Robert R. Putz. Aug 62, 35p. illus. 22 refs.
(Contract NBy-32206)
Unclassified report

DESCRIPTORS: *Barges, *Loading (Mechanics), Motion, Hydrostatics, Hydrodynamics, Construction, Water waves.

Results and methods are given for a theoretical study of the behavior of a moored construction-type barge and that of a load, lowered by means of a line from the barge, in irregular seas in deep water. The mooring system considered is a conventional line-and-anchor type, with both bow and stern moorings. Load-lowering through the hull as well as by means of a boom having variable azimuth angle is considered. Equations of motion of the system for sinusoidal waves of arbitrary length and direction are formulated for six degrees of freedom, and take into account both hydrostatic and hydrodynamic effects.

Following the evaluation of the excitation functions and the coefficients in the equations (based on the particular barge under study), sinusoidal solutions of these equations are obtained for each of the six barge motions (surge, heave, pitch, sway, roll, and yaw), as well as for the three rectangular components of the load displacement vector, the vertical component of the load acceleration and the added dynamic tension in the lowering line. In addition, solutions are obtained for the forces in the mooring cables and the horizontal components of the force and the yawing moment induced by the mooring system on the barge. (Author)

AD-296 790 Div. 9, 12, 22
(TISTA/VGW) OTS price $1.60

Lincoln Lab., Mass. Inst. of Tech., Lexington.
NEWTONIAN DRAG OF COATED CYLINDERS,
by Aubyn Freed. 7 Jan 63, 17p. incl. illus.
2 refs. (Rept. no. 22 G-13)
(Contract AF 19(628)500)
(AFESD TDR 63-20) Unclassified report

DESCRIPTORS: *Re-entry vehicles, *Cylindrical bodies, *Aerodynamic heating, Drag, Supersonic flow, Ablation, Density, Effectiveness, Thickness, Differential equations, Coatings, Atmosphere entry.

Newtonian impact theory is used to examine the variation in ballistic coefficient of a coated cylinder as the thickness of the coating decreases. It is shown that when the density of the coating is less than one-half that of the core-material, an initial value of coating-thickness can be chosen which results in a steady increase of the ballistic coefficient as the thickness of the coating tends to zero. The largest such value of coating-thickness, the corresponding minimum value for the ballistic coefficient, and the rate at which the ballistic coefficient rises to that of the bare core are shown to be simple functions of the particular density-ratio. (Author)

AD-296 826 Div. 9, 25
(TISTP/JW) OTS price $2.60

Rensselaer Polytechnic Inst., Troy, N. Y.
STRESS PROPAGATION IN NON-LINEAR VISCOELASTIC MATERIALS: NUMERICAL CALCULATIONS,
by Edward J. Mercado. 31 Jan 63, 16p. illus.
10 refs. (Technical rept. no. 5)
(Contract DA 30-115-509-ORD-1009)
Unclassified report

DESCRIPTORS: *Stresses, Propagation, Elasticity, Computers, Particles, Viscosity, Velocity, Mathematical analysis.

AD-296 850 Div. 9, 25
(TISTP/JW) OTS price $2.60

Brown U., Div. of Applied Mathematics, Providence, R. I.
VARIATIONAL PRINCIPLES IN THE LINEAR THEORY OF VISCOELASTICITY,
by M. E. Gurtin. Jan 63, 25p. 18 refs.
(Technical rept. no. 18)
(Contract Nonr-56225, Proj. NR 064-431)
Unclassified report

DESCRIPTORS: *Viscoelasticity, *Equations, Analysis of variance, Electrostatic fields, Boundary layer transitions, Stresses, Equations of state, Linear systems, Theory.

AD-296 858 Div. 9
(TISTP/JW) OTS price $4.60

Ballistic Research Labs., Aberdeen Proving Ground, Md.
DETERMINATION OF VISCOELASTIC MODEL CONSTANTS FROM DYNAMIC MECHANICAL PROPERTIES OF LINEAR VISCOELASTIC MATERIALS,
by W. Goldberg and N. W. Dean. Nov 62, 42p. incl. illus. tables, 13 refs. (Rept. no. 1180)
Unclassified report

DESCRIPTORS: *Viscoelasticity, *Fluid mechanics, Dynamics, Linear systems, Models (Simulations), Frequency, Mechanical properties, Temperature.

AD-296 874 Div. 9
(TISTA/GEC) OTS price $6.60

Aeronautical Research Associates of Princeton, N. J.
EXPERIMENTAL INVESTIGATION OF THE STRUCTURE OF VORTICES IN SIMPLE CYLINDRICAL VORTEX CHAMBERS,
by Coleman duP. Donaldson and Richard S Snedeker. Dec 62, 1v. incl. illus. 10 refs.
(ARAP rept. no. 47)
(Contract 49(638)255)
Unclassified report

DESCRIPTORS: *Vortices, Turbulence, Mathematical analysis, Laminar boundary layer, Tests, Velocity, Test methods, Aerodynamic characteristics, Fluid dynamic properties, Test equipment, Fluid flow, Hilsch tubes.

An experimental study of the character of vortices in simple cylindrical vortex chambers completely open at one end is presented. Special attention is given to the problem of the transition from one-celled to two-celled vortex chambers having length-to-diameter ratios in the range $0 < L/D < 5$, the character of the flow is primarily dependent on the ratio of a characteristic tangential velocity to a characteristic radial velocity V/U. In addition, it is shown that the Reynolds number based on the radial flow, while a parameter of major importance in laminar vortices, plays but a minor role in turbulent vortex motion. Transition from one-celled to two-celled vortex structure started for all vortex configurations tested ($0 < L/D < 5$) when V/U exceeded approximately 3. (Author)

10. FUELS AND COMBUSTION

AD-296 018 Div. 10
(TISTM/SJR) OTS price $2.60

Ammunition Group, Picatinny Arsenal, Dover, N. J.
DETERMINATION OF AVAILABLE STABILIZER IN AGED PROPELLANTS CONTAINING EITHER DIPHENYLAMINE OR ETHYL CENTRALITE,
by Milton Roth. Feb 63, 8p. illus. tables,
11 refs. (Technical memo. no. 1107)
Unclassified report

DESCRIPTORS: *Propellants, *Stability, *Storage, Chemical analysis, Ultraviolet spectroscopy, Aging, Degradation.

In general, stabilizers function by undergoing chemical reaction with propellant decomposition

products. Therefore the analytical method must be able to distinguish between the original material and the products of reaction. A number of methods have been described and a preliminary evaluation of these methods was conducted by several laboratories under a cooperative program. Based on results from these screening tests, the Picatinny Arsenal spectrophotometric methods for available stabilizer and primary degradation products were selected for further study. The initial phase of this program was an attempt to standardize the necessary spectrophotometric factors. It was found that significant differences, in regard to the factors obtained, existed between laboratories. It was expected, however, that these differences would be cancelled in the analysis of samples if each laboratory used the factor appropriate to its spectrophotometer. Therefore, the Panel recommended that a round robin be conducted on aged propellants containing either diphenylamine (DPA) or ethyl centralite (EC). (Author)

AD-296 089 Div. 10, 30, 16
(TISTB/MD) OTS price $1.10

6570th Aerospace Medical Research Labs., Aerospace Medical Div., Wright-Patterson Air Force Base, Ohio.
DETECTION OF MICROBIAL CONTAMINANTS IN JP-4 FUEL,
by Marilyn E. George. Jan 63, 6p. incl. tables. (AMRL memo. no. M-26)
Unclassified report

DESCRIPTORS: *Jet engine fuels, *Microorganisms, *Fuel contamination, Bacteria, Fungi, Metabolism, Yeasts, Measurement, Carbon dioxide, Fuel tanks, Storage tanks, Contamination, Detection.

A qualitative method for the detection of living microorganisms in JP-4 fuel based on the measurement of CO2 produced by cellular respiration is described. Methods of quantitation are being investigated but have not yet proved satisfactory. (Author)

AD-296 200 Div. 10, 4, 14, 17
(TISTM/ODN) OTS price $3.60

Bell Aerosystems Co., Buffalo, N. Y.
COMPILATION OF MATERIAL COMPATIBILITY TEST DATA WITH PROPELLANTS,
by A. M. Gritzmacher. Dec 62, 28p. incl. tables (Rept. no. 2084-939-001)
(Contract AF 33(657)8555)
Unclassified report

DESCRIPTORS: *Propellants, *Metals, *Elastomers, *Plastics, Experimental data, Hydrogen peroxide, Halocarbon plastics, Stainless steel, Liquid rocket propellants, Surface properties, Tensile properties, Elasticity, Volume, Hardness, Materials, Tables, Mechanical properties, Compatibility.

AD-296 321 Div. 10, 25, 4
(TISTM/SJR) OTS price $2.60

Rocket Power, Inc., Pasadena, Calif.
STUDY OF ROCKET ENGINE EXHAUST PRODUCTS.
Quarterly rept. no. 6, 1 Sep-30 Nov 62,
by M. A. Greenbaum, R. E. Yates and others.
30 Nov 62, 20p. incl. illus. tables, 31 refs.
(Rept. no. QR-7414-6)
(Contract AF 04(611)7414)
Unclassified report

DESCRIPTORS: *Rocket motors, *Beryllium compounds, *Thermodynamics, Test equipment, Test methods, Chlorides, Nitrides, Oxides, Electron bombardment, Furnaces, High temperature research, Calorimeters, Heat of fusion, Vacuum apparatus, Vapor pressure, Molecular properties, Heat of solution, Heat of formation, Gas flow, Exhaust gases, Rocket propellants.

Specially designed apparatus for use in the studies of the thermodynamic properties of BeCl, BeCl2, BeO and Be3N2 was constructed. These items include an electron bombardment furnace--Southard drop calorimeter combination for the study of the heat capacity and heat of fusion of BeO; an ultra-high vacuum system (10 to the -10th power mm of Hg) for the study of the vapor pressures of BeCl2 and Be3N2; and a vacuum apparatus for the molecular flow effusion study of the thermodynamics of BeCl(g). Preliminary values for the heat of formation of BeCl(g) and the heat of sublimation of BeCl2 were obtained. (Author)

AD-296 762 Div. 10, 14
(TISTM/EJH) OTS price $15.00

Army Engineer Research and Development Labs., Fort Belvoir, Virginia.
DIFFUSION BURNING OF LIQUIDS,
by V. I. Blinov and G. N. Khudyakov. 1961, 221p. incl. illus. tables, 30 refs. (Translation no. T-1490a-c)
Unclassified report

DESCRIPTORS: *Fuels, *Combustion, *Liquids, *Organic compounds, Diffusion, Ignition, Flames, Gasoline, Oils, Mixtures, Fuel tanks, Jets, Water, Foams, Petroleum, Sprays, Air, Fire extinguishers, Hazards, Theory.

In the last 15 years a considerable amount of experimental and some theoretical information on the combustion of liquids in tanks has accumulated; but has not been widely published. Part I of the book is concerned with the flammability and ignition of liquids and the properties of mixtures of liquids. Part II is devoted to the burning of liquids. Problems investigated include those connected with the shape and dimensions of flames, pulsations, temperature, radiation and various combustion regimes. Changes in the composition of liquids during combustion, measurements of burnup rates, temperature distribution in burning liquids, and reasons for the appearance and development of a hot homothermic layer in burning gasoline, petroleum and certain other liquids are discussed. The problem of the ejection of a burning liquid during combustion and the serious consequences that may ensue are considered. Part III is concerned with the mechanism of extinguishing flames from liquids in tanks by means of foam, sprays of water and other methods. (Author)

AD-296 873 Div. 10, 14, 16
(TISTM/EJH) OTS price $1.60

Biomedical Lab., Aerospace Medical Div., Wright-Patterson Air Force Base, Ohio.
AIR FORCE PROGRAMS IN FUEL MICROBIOLOGY,
by Sheldon A. London. Jan 63, 13p. incl. tables, 11 refs.
(AMRL memo. no. M-24) Unclassified report

DESCRIPTORS: *Research program administration, *Air force research, *Jet engine fuels, *Aviation fuels, *Microorganisms, Decontamination, Lubricants, Fuel tanks, Contamination, Fuel additives, Lubricant additives, Fuels.

Division 11 - GROUND TRANSPORTATION EQUIPMENT
Division 12 - GUIDED MISSILES

A summary is presented of research programs connected with the 11 Air Force contracts awarded during 1962 for work connected with inhibition of micro-organism contamination of aviation fuels and lubricants.

11. GROUND TRANSPORTATION EQUIPMENT

AD-296 475 Div. 11
(TISTA/FRL) OTS price $2.60

Naval Research Lab., Washington, D. C.
THE DEVELOPMENT OF A COMBINATION RUNWAY FOAMING-TANKER VEHICLE FOR AUGMENTING NAVAL AIR STATION FIRE FIGHTING OPERATIONS,
by H. B. Peterson, R. L. Gipe and R. L. Tuve.
31 Jan 63, 22p. incl. illus. 2 refs. (NRL rept. no. 5887)
Unclassified report

DESCRIPTORS: *Firefighting vehicles, Foams, Water, Runways, Spray tanks, Coatings, Design, Tanks (Containers), Aviation accidents.

A vehicle to combine the functions of foaming runways for emergency aircraft landing and serving as a 'nurse' truck to resupply water and foam concentrate to aircraft fire fighting vehicles has been constructed. This vehicle is to serve as a prototype to illustrate and define some of the features deemed critical for successful operations. Certain elements are left flexible so that conversions can be made from different large capacity tank vehicles. (Author)

AD-296 871 Div. 11
(TISTE/OHD) OTS price $8.60

Aerojet-General Corp., Sacramento, Calif.
STRUCTURAL VERIFICATION TESTS OF THE AEROJET UTILITY VAN,
by W. D. Hulse. Dec 62, 1v. incl. illus. tables.
(Rept. no. 0162-01TN-62-20)
(Contract AF 33(600)36610)
(BSD TDR 62-330) Unclassified report

DESCRIPTORS: *Trailers, *Stresses, Guided missiles (Surface to surface), Test methods, Loading (Mechanics), Deflection, Strain gages, Experimental data, Rocket motors (Solid propellant).

Structural tests to verify the acceptability of the utility van as a transport vehicle for second-stage Minuteman operational motors were successfully completed. During the tests, the van and tie-downs were subjected to limit loads to determine stress levels at critical load points and to measure vehicle deflection and recovery from the downward and side loads imposed. (Author)

AD-296 872 Div. 11
(TISTE/OHD) OTS price $4.60

Aerojet-General Corp., Azusa, Calif.
RESULTS AND ANALYSES OF AEROJET-GENERAL UTILITY VAN CERTIFICATION PROGRAM.
Dec 62, 12p. incl. illus. tables (Rept. no. 0162-01TN-62-19)
(Contract AF 33(600)36610)
(BSD-TDR-62-329) Unclassified report

DESCRIPTORS: *Trailers, *Test methods, Guided missiles (Surface to surface), Rocket motors (Solid propellant), Roads, Acceleration, Accelerometers, Transportation, Experimental data, Tests.

The trailer successfully completed certification-test requirements to qualify as a transport vehicle for Minuteman second-stage operational motors. The trailer, while transporting live second-stage motors supported in a universal harness, was subjected to a series of plank-strip-course and rough-road condition tests to produce sinusoidal inputs to accelerometer locations on the universal harness and motor. A comparative analysis of the acceleration-response data recorded during these tests with data recorded during the tests of four other van-harness combinations is presented. (Author)

12. GUIDED MISSILES

AD-296 068 Div. 12, 5
(TISTA/GEC) OTS price $9.60

RAND Corp., Santa Monica, Calif.
COMMUNICATIONS SATELLITES: TECHNOLOGY, ECONOMICS, AND SYSTEM CHOICES,
by S. H. Reiger, R. T. Nichols and others.
Feb 63, 101p. incl. illus. tables, refs.
(Research memo. no. RM-3487-RC)
Unclassified report

DESCRIPTORS: *Communications satellites (Active), Global communication systems, Economics, Synchronous satellites, Orbital trajectories, Reliability (Electronics), Radio relay stations, Telephone communication systems, Operations research, Communication satellites (Passive), Costs, Satellite networks.

A study was made of possible system choices to establish a commercial communications satellite system as promptly as possible and to extend it to provide global coverage at the earliest possible date. The key technological problem is that of satellite reliability, for without sufficiently long operating lifetimes in orbit, replacement costs would make any satellite system too expensive. Minimum costs of a satellite system would be large, and the circuit capacities provided would represent a large increment over existing capacities. Cost estimates are made for representative stationary and non-stationary active satellite systems. Stationary satellites would be adopted when they are sufficiently reliable, but an early regional and limited global system could begin with simple random satellites in mid-altitude orbits using currently available launch vehicles. It was concluded that such a system, put in operation in the next few years, could earn some revenues almost immediately; at first mainly for trans-atlantic services, and later world wide. (Author)

AD-296 175 Div. 12, 18
(TISTW/RD) OTS price $8.60

George Washington U., Washington, D. C.
THE POLARIS MILITARY ESSENTIALITY SYSTEM,
by Marvin Denicoff, Joseph Fennell and others.

10 Jan 63, 59p. illus. tables, 17 refs. (Serial no. T-148, rev.; Polaris Logistics Studies no. 1) (Contracts Nonr-76103, Proj. NR 345 107, Nonr-76105, Proj. NR 047 001 and Nonr-76106, Proj. NR 347 008)
Unclassified report

DESCRIPTORS: *Guided missiles (Underwater to surface), *Nuclear-powered vessels, *Submarines, Maintenance, Reliability, Failure (Mechanics), Logistics.

AD-296 254 Div. 12, 11
(TISTW/PCR) OTS price $5.60

Aerojet-General Corp., Sacramento, Calif.
HIGH- AND LOW-TEMPERATURE TESTS OF THE AEROJET UTILITY VAN,
by J. D. Sohl. 19 Dec 62, 1v. incl. illus.
(Rept. no. 0162-01TN-62-18)
(Contract AF 33(600)36610)
(BSSD TDR 62-331) Unclassified report

DESCRIPTORS: *Trailers, *Rocket motors (Solid propellants), Guided missiles (Surface-to-surface), Ground support equipment, Tests, Test methods, Temperature, High temperature research, Instrumentation, Temperature control, Calibration, Photographs, Rocket motors.

The utility van successfully completed high- and low-temperature tests to verify its acceptability as a transport vehicle for second-stage Minuteman operational motors. A Minuteman motor cast with propellant simulant was used in the tests. While the exterior of the van was subjected to high and low temperatures, ranging from 140 to -35 F, the surface of the motor was maintained within the specified temperature range of 80±20 F. (Author)

AD-296 285 Div. 12, 30
(TISTW/JEA) OTS price $2.60

Land-Air Inc., Point Mugu, Calif.
INTRODUCTION TO THE PMR REAL TIME DATA PROCESSING SYSTEM,
comp. by Richard Johnson. 2 Jan 63, 23p. (Technical note no. 3285-243)
(Contract N-123(61756)19425A)
Unclassified report

DESCRIPTORS: *Data processing systems, *Data transmission systems, *Impact computers, *Ranges (Establishments), *Radar signals, *Radar echo areas, Digital computers, Programming, Time signals, C band, Data storage systems, Fire control computers, Radar equipment, Guided missile tracking systems, Search radar, Digital systems, Teletype systems, Fire control systems, Instrumentation.

Research is presented on the PMR Real Time data processing system. The scope and function of the system at its present stage of development is explained. The document includes a block diagram of the flow of information to the PMR digital data system, the programming requirement for the Larey-LeRoy computer buffer system for the IBM 7090, a list of people who may be contacted for additional information on the individual subsystems. A brief description of the following is given: AN/FPS-16 radar, missile tracking radar, Cotar, digital distribution unit, speed changer and buffer, Collins TE-206 Kineplex transmitter and receiver, data multiplexing synchronizer, MicroSADIC and DOLAR systems, teletype, paper tape, Larey-LeRoy computer buffer system, and real time input record. (Author)

AD-296 296 Div. 12, 30
(TISTW/PCR) OTS price $6.60

Land-Air, Inc., Point Mugu, Calif.
NIKE-ZEUS AUTOMATIC DESTRUCT RANGE SAFETY PROGRAM FOR THE IBM 7090 COMPUTER,
by T. O. Rickman and R. Holguin. 21 Nov 62, 63p. incl. illus. tables (Rept. no. 36)
(Contract N123(61756)19425A)
Unclassified report

DESCRIPTORS: *Guided missiles (Surface to air), *Programming (Computers), *Guided missile safety, Radar tracking, Guided missile tracking systems, Automatic, Voice communication systems, Polynomials, Computer logic, Impact computers, Equations, Control systems, Destructors, Guided missile ranges.

The Pacific Missile Range System which inputs data to the IBM 7090 Computer at 20 samples/sec consists of (1) Cotar which outputs direction cosines alpha and beta, (2) AN/FPS-16 radar slaved to the Cotar and which outputs range only, and (3) a second AN/FPS-16 radar free to skin-track and output polar coordinate data, becoming another source of input to the computer. A fourth source of data is the Missile Tracking Radar which outputs raw polar data at the rate of 8.123 samples/sec. The single system chosen to control destruct computation and impact prediction is based on data quality as determined by comparing rates of change in position and velocity differences with predicted standards. This choice is also influenced by ranking input systems based on their respective inherent reliabilities. Computer output consists of predicted missile impact location, present position, velocity, acceleration displayed at a remote location. The same output and all raw input data are recorded on tape for postflight usage. (Author)

AD-296 372 Div. 12, 2
(TISTA/GEC) OTS price $3.60

Lockheed Aircraft Corp., Sunnyvale, Calif.
SOLAR RADIATION PRESSURE TORQUES AND GEOMAGNETIC EFFECTS ON SATELLITE ORBITS. AN ANNOTATED BIBLIOGRAPHY.
Bibliography for 1943-1961,
comp. by William L. Hollister. Jan 62, 35p. 94 refs. (Special bibliography no. SB-61-66; Rept. no. 3-77-61-22)
(Contract AF 04(647)787)
Unclassified report

DESCRIPTORS: *Satellites (Artificial), *Orbital trajectories, *Bibliography, *Solar radiation, *Perturbation theory, Solar radiation, Terrestrial magnetism, Attitude control systems, Pressure, Stabilization systems, Abstracts, Torque.

AD-296 397 Div. 12, 19
(TISTE/OHD) OTS price $8.10

Gulton Industries, Inc., Metuchen, N. J.
CRYSTAL RATE GYRO.
Rept. for Mar 58-Mar 61,
by Lloyd Germain and Thomas Wing. Aug 61, 81p. incl. illus. tables, 4 refs.
(Contract AF 33(616)5561, Proj. 0(610-4431)
(ASD TR 61-253) Unclassified report

DESCRIPTORS: *Gyroscopes, *Piezoelectric transducers, *Tuning forks, *Inertial guidance, Ceramic materials, Configuration, Lead compounds, Titanates, Zirconates, Temperature, Strain gages, Interferometers, Mathematical analysis, Vibrations.

Division 12 - GUIDED MISSILES

Efforts are reported to fabricate a vibratory gyro to detect very low rates of turn. The field of endeavor fell into three phases. Phase I dealt with attempts to utilize piezo electric ceramics as the vibratory element. Various configurations and measurements are discussed in detail. The maximum output was 500 microv. at 360 /sec with a zero rate of 3800 microv. without repeatability. Phase II was concerned with the use of lower frequency electro-mechanical vibratory elements in measuring the required angular rates. The results obtained from using the resultant crude tuning forks rate sensors are fully discussed. Using null circuitry at 0.5 rpm, an output of 2 volts was obtained for signal to noise ratio of 1. This was not repeatable without readjustment. Although far from satisfactory, the results of Phase II indicated the correct direction to continue. Phase III dealt with fabrications of precision tuning forks. The results achieved are discussed and solutions to problems are proposed. Under optimum conditions, the refined gyro was able to detect a rate of 1 revolution in 100 days. (Author)

AD-296 509 Div. 12
(TISTW/JEA) OTS price $1.10

Army Missile Command, Redstone Arsenal, Huntsville, Ala.
A SECOND STUDY ON REDUCTION OR ELIMINATION OF AIR CONDITIONING IN THE PERSHING GUIDANCE AND CONTROL COMPARTMENT,
by Peter VanHoff and Russell T. Gambill.
24 Jan 63, 8p. (Rept. no. RG-TR-63-4)
(Proj. 1-B-2-79191-D-678)
Unclassified report

DESCRIPTORS: *Guided missiles (Surface to surface), *Control systems, *Computers, *Air conditioning equipment, Gyroscopes, Accelerometers, Gimbals, Servomotors, Gears, Servo amplifiers, Temperature control, Inertial guidance.

AD-296 518 Div. 12
(TISTW/JEA) OTS price $5.60

Army Electronics Research and Development Lab., Fort Monmouth, N. J.
SHORT-RANGE MISSILE LAUNCH LOCATOR AN/TNS-5. Engineering test rept.,
by Murray Goldstein. Aug 62, 1v. incl. illus. tables (AERADL test rept. no. 1505)
Unclassified report

DESCRIPTORS: *Guided missiles, *Guided missile launchers, *Guided missile detection, *Guided missile models, Microphones, Azimuth, Oscilloscopes, Digital computers, Processing, Position finding, Frequency, Analog computers, Radio transmitters, Recording systems, Reliability, Human engineering, Intercommunication systems, Power supplies, Oscillators, Servomechanisms, Design, Sound transmission, Launching, Detection, Sound ranging, Flight testing, Radio signals.

AD-296 558 Div. 12
(TISTW/JEA) OTS price $10.50

Space Technology Labs., Inc., Redondo Beach, Calif.
SPECIFICATION DESIGN STUDY FOR FLIGHT TESTING INERTIAL GUIDANCE SYSTEMS GEM (GUIDANCE EVALUATION MISSILE).
Monthly progress rept. no. 2, 15 Dec 61-22 Jan 62.
23 Jan 62, 130p. incl. illus. tables, 16 refs.
(Rept. no. 8640-6006-CU000)
(Contract AF 29(600)3300, Proj. 5177)
Unclassified report

DESCRIPTORS: *Inertial guidance, *Simulation, *Radar tracking, *Guided missile trajectories, Aerodynamic control surfaces, Telemeter systems, Control systems, Re-entry vehicles, Recovery, Specifications, Aerodynamic configurations, Design, Interferometers, Temperature, Instrumentation, Installation, Non-destructive testing, Flight testing, Errors, Guided missiles, Analysis.

AD-296 560 Div. 12
(TISTW/JEA) OTS price $12.00

Space Technology Labs., Inc., Redondo Beach, Calif.
SPECIFICATION DESIGN STUDY FOR FLIGHT TESTING INERTIAL GUIDANCE SYSTEMS GEM (GUIDANCE EVALUATION MISSILE).
Monthly progress rept. no. 3, 22 Jan-28 Feb 62.
1 Mar 62, 164p. incl. illus. tables, 7 refs.
(Rept. no. 8640-6012-CU000)
(Contract AF 29(600)3300, Proj. 5177)
Unclassified report

DESCRIPTORS: *Inertial guidance, *Thermodynamics, *Aerodynamic configurations, *Guided missile trajectories, Aerodynamic control surfaces, Antennas, Errors, Simulation, Telemeter systems, Installation, Specifications, Automatic pilots, Reentry vehicles, Control systems, Temperature, Velocity, Instrumentation, Radar tracking, Guided missile detection, Flight testing, Guided missiles, Design, Analysis.

AD-296 571 Div. 12
(TISTW/RD) OTS price $2.60

Barnes Engineering Co., Stamford, Conn.
PROJECT DAZZLE. BLACK KNIGHT REENTRY PHYSICS PROGRAM.
Semi-Annual rept. on Infrared and Electro-Optics,
by Edward W. Skalandunas. 14 Jan 63, 24p. incl. illus. (Rept. no. BEC 4278-SA-1)
(Contract DA 19-020-ORD-5703)
Unclassified report

DESCRIPTORS: *Guided missile tracking systems, *Hypersonic test vehicles, *Re-entry vehicles, *Ranges (Establishments), Radar tracking, Infrared tracking, Optical tracking, Recording systems, Atmosphere entry, Instrumentation.

AD-296 784 Div. 12
(TISTA/FRL) OTS price $8.10

General Electric Co., Cincinnati, Ohio.
SPACECRAFT ELECTRIC GENERATING AND PROPULSION SYSTEM INTEGRATION.
Quarterly status rept. no. 3 for period ending 31 Dec 62.
31 Dec 62, 81p. incl. illus. table.
(Contract AF 33(657)8488)
Unclassified report

DESCRIPTORS: *Electric power production, *Electric propulsion, Digital computers, Models, Turbines, Generators, Design, Space propulsion, Nuclear propulsion, Transmission lines, Programming, Ion engines, Arc-jet engines, Spacecraft.

Initial work has been devoted to optimization of (1) nuclear space power plant-transmission line system, and (2) a space power plant condensing radiator panel. The process of solving these two problems has served to clarify the capabilities of the two computer programs comprising LEADER and to identify the various procedural elements which must be performed in order to achieve effective utilization of the LEADER technique. These procedural elements are being described in a User's Manual in order to facilitiate the application of LEADER to subsequent problems. Generating and accumulating basic design data on the major sub-systems for 350 KW arc jet and 1 MW ion engine power-propulsion systems has continued. Design procedures and performance characteristics were established for the turbine, and generator subsystems. The task of formulating the analytical model of these sub-systems was initiated. (Author)

AD-296 836 Div. 12
(TISTA/FRL) OTS price $1.60

System Development Corp., Santa Monica, Calif.
PERIODIC ORBITS ABOUT AN OBLATE PLANET,
by Richard B. Barrar. 9 Jan 63, 16p. 8 refs.
(Rept. no. SP-1067/000/00)
Unclassified report

DESCRIPTORS: *Orbital trajectories, *Synchronous satellites, Motion, Differential equations, Integral equations, Inclined orbit trajectories, Equations, Mathematical analysis.

Periodic solutions of the equations of motion of a satellite of an oblate planet are investigated, using methods developed by Poincare (1892). The treatment covers both critical and non-critical angles. (Author)

AD-296 837 Div. 12
(TISTA/FRL) OTS price $1.60

System Development Corp., Santa Monica, Calif.
PERIODIC ORBITS NEAR THE CRITICAL INCLINATION ANGLE,
by Richard B. Barrar. 28 Jan 63, 11p. 8 refs.
(Rept. no. SP-1067/001/00)
Unclassified report

DESCRIPTORS: *Orbital trajectories, Motion, Mathematical analysis, Partial differential equations, Space buoys, Inclined orbit trajectories, Synchronous satellite.

The existence of periodic orbits near the critical inclination angle for the equations of motion of a satellite of an oblate planet are investigated. In the immediate neighborhood of the critical angle these periodic orbits are librations. The period of these orbits is shown to be extremely long. (Author)

AD-296 899 Div. 12
(TISTA/GEC) OTS price $10.50

Martin-Marietta Corp., Denver, Colo.
EXPANDABLE SPACE STRUCTURE.
Interim rept., 1 Nov 62-31 Jan 63 on Semirigid or Nonrigid Structures for Space Applications,
by P. M. Knox, Jr., A. Corell and E. Lane.
31 Jan 63, 137p. incl. illus. tables (Rept. no. ASD-CR-63-4)
(Contract AF 33(657)9733, Proj. 1368)
(ASD TDR 7-943a(1) Unclassified report

DESCRIPTORS: *Space stations, *Inflatable structures, *Extendable structures, Pneumatic devices, Diaphragms (Mechanics), Solar radiation, Meteorites, Tests, Test methods, Design, Manufacturing methods, Thermal radiation, Configuration, Joints, Space environmental conditions, Simulation, Mathematical analysis, Digital computers, Penetration, Sealing compounds, Construction, Materials.

A representative space mission profile is defined at an altitude of 257 n mi and 33.3 deg inclination. Preliminary design criteria, including structural loads and space environmental conditions, are established. Effects of thermal radiation, meteoroids, and space radiation are discussed. Results of thermal heat balance analyses programed on the IBM 7090 are presented. Structural factors of safety are defined. A structural configuration is chosen from the standpoint of strength, operational reliability, manufacturing feasibility, and minimum weight and cost. Preliminary tooling and fabrication studies are discussed. Tests completed to determine feasibility of deployment and stowage are discussed. (Author)

AD-296 909 Div. 12, 24
(TISTA/LSK) OTS price $3.60

Naval Missile Center, Point Mugu, Calif.
DEVELOPMENT AND TESTING OF A RECOVERABLE PROBE (RSP),
by J. M. Perkins and G. T. Pursel. 18 Feb 63, 29p. incl. illus. tables, 3 refs. (Technical memo. no. NMC-TM-62-22)
Unclassified report

DESCRIPTORS: *Sounding rockets, *Rocket noses, Air to surface, Airborne, Parachutes, Jet fighters, Aerial cameras, Surface targets, Resolution, Space probes, Aerial photography, Recovery.

The development and flight-testing of a recoverable, high-altitude probe is described. The air-launched vehicle, designated the Recoverable SPAROAIR Probe (RSP), ascends to an altitude of approximately 150,000 feet carrying a 70mm camera as payload. The camera, contained in a capsule, is recovered from the sea following water impact. The significant characteristics of the probe are: the aerodynamic design of the recoverable capsule provides orientation of the capsule during camera operation and descent; the aft lid of the capsule is utilized as the deceleration device in lieu of a parachute system; and the structural design and payload packaging permits a velocity of 150 feet per second at water impact without damage to the structure or components contained in the capsule. (Author)

13. INSTALLATIONS AND CONSTRUCTION

AD-296 173 Div. 13
(TISTE/OHD) OTS price $5.60

Rutgers U. Coll. of Engineering, New Brunswick, N. J.
EVALUATION AND DEVELOPMENT OF A RATIONAL THEORY FOR THE DESIGN OF SEWAGE STABILIZATION PONDS.
Final technical rept., 1 July-31 Aug 62,
by John P. Lawler, Wilbert H. Schlimmeyer and Marvin L. Granstrom. 30 Jan 63, 47p. incl. illus. tables, 11 refs.
(Contract DA 49-193-md-2317)
Unclassified report

DESCRIPTORS: *Sanitary engineering, *Sewage, *Wastes (Sanitary engineering), Dams, Design, Analysis, Data, Processing, Water supplies.

Research was conducted to evaluate a method suggested for the design of sewage oxidation ponds. It is suggested that oxidation ponds are usually overdesigned and that beyond some detention time, or below some loading value termed critical loading value, the biological activity of the pond is primarily self-perpetuating and cyclic, and does not serve to reduce BOD or coliform bacteria. It is suggested that operational experience be considered in light of this concept to lead to a uniform and systematic accounting of the performance of oxidation ponds. A brief discussion of the problem of odors due to anaerobiasis is included. (Author)

AD-296 236 Div. 13, 3
(TISTA/FRL) OTS price $9.60

Westinghouse Electric Corp., Mansfield, Ohio.
DEVELOPMENT OF A SPECIFICATION FOR A 75 CFM GAS PARTICULATE FILTER UNIT FOR REMOVING THE CBR CONTAMINANTS OF WARFARE FROM THE AIR SUPPLIED TO FAMILY SHELTERS.
Final rept.
17 Sep 62, 111p. incl. illus. tables.
(Contract DA 18-108-cml-7029; In cooperation with Westinghouse Research Labs., Pittsburgh, Pa.)
Unclassified report

DESCRIPTORS: *Gas filters, *Shelters, Air, Purification, Tests, Costs, Economics, Feasibility studies, Chemical warfare agents, Radiological contamination, Design, Blowers.

An intensive development program was carried out to develop specifications for the chemical, biological and radiological (CBR) Gas Particulate Filter Unit. All available components and air purification methods were evaluated in light of end use requirements. Design concepts and parameters were established after careful consideration of required performance and economics. Based on this program, a recommendation is made for the performance specifications of the CBR Gas Particulate Filter Unit. It is our belief that adherence to this specification will insure the procuring of gas particulate filter units of consistent quality, and at reasonable cost to the user. (Author)

AD-296 240 Div. 13, 25, 9
(TISTP/MB) OTS price $10.50

Illinois U., Urbana.
INTERACTION OF PLANE ELASTIC WAVES WITH AN ELASTIC CYLINDRICAL SHELL.
Technical report on Civil Engineering Studies,
by T. Yoshihara, A. R. Robinson and J. L. Merritt. Jan 63, 129p. incl. illus. tables, 9 refs. (Structural research series no. 261)
(Contract Nonr-183403, Proj. NR 064-183)
Unclassified report

DESCRIPTORS: *Elastic shells, *Stresses, Motion, Equations, Mechanical waves, Cylindrical bodies, Structural shells, Elasticity, Isotropism, Fourier's analysis, Series, Numerical analysis, Structural properties, Differential equations, Shock waves, Mathematical analysis.

The interaction of plane elastic waves with a thin, hollow, cylindrical shell embedded in an elastic medium are investigated. The cylindrical shell is considered to be elastic, isotropic, homogeneous, and of infinite length. It is surrounded by an elastic, isotropic, and homogeneous medium whose motions conform to the ordinary theory of elasticity. A plane stress wave, either dilatational or shear, with a step variation in time, whose wave front travels in a direction perpendicular to the cylinder axis, envelops the shell. Later, a Duhamel integral is used to study other wave shapes for the incident stress. (Author)

AD-296 298 Div. 13, 8
(TISTP/MB) OTS price $8.60

Lincoln Lab., Mass. Inst. of Tech., Lexington.
DISTORTIONS AND STRESSES OF PARABOLOIDAL SURFACE STRUCTURES. PART I,
by James W. Mar and Frederic Y. M. Wan.
9 Jan 62, 1v. incl. illus. 21 refs. (Rept. no. 71G-1)
(Contract AF 19(604)7400)
(AFESD TDR 62-272) Unclassified report

DESCRIPTORS: *Structural shells, *Radar antennas, Parabolic antennas, Structures, Stresses, Tensor analysis, Mechanical properties, Mathematical analysis, Antenna configurations.

AD-296 387 Div. 13, 17
(TISTM/SJR) OTS price $2.25

Naval Civil Engineering Lab., Port Hueneme, Calif.
WAREHOUSE AND PRESERVATION METHODS AND ECONOMICS FOR STORING MATERIEL.
Final rept.,
by R. J. Zablodil and J. C. King. 27 Dec 62, 86p. incl. illus. tables (Technical rept. no. R 221)
Unclassified report

DESCRIPTORS: *Storage, *Controlled atmospheres, *Naval equipment, *Humidity, Aluminum, Copper, Steel, Armed forces research, Warehouses, Degradation, Corrosion inhibition.

Similar paired items of military equipment were stored in different storage environments--an open-air slab, a shed, a standard warehouse, a 50% RH warehouse, and a 40% RH warehouse. One of each pair had light domestic treatment and the other full contact-preservation treatment. Deterioration was permitted to develop at its natural rate in each environment. Periodic inspections determined the protection afforded by each storage environment and preservation level by the extent of deterioration encountered. Results are presented in two parts: (1) efficacy of storage environments, and (2) economy of storage systems. Part 1 shows that protection is poor in open-air storage, fair in a shed, good in the standard warehouse, and excellent in controlled-humidity warehouses. Compared to domestic treatment, contact preservation decreased the incidence of rust about 58% for open-air storage, 44% for the shed, and 30% for the standard warehouse; no rust due to storage environment occurred in the controlled-humidity warehouses for either preservation level. Part 2 shows that, under environmental conditions similar to those of the test, storage in the 50% RH warehouse using domestic treatment is usually cheaper, but that the standard warehouse with this treatment is cheaper for automotive and non-metallic equipment. It is cheaper to protect equipment stored for stateside use with domestic treatment, but contact preservation is cheaper for overseas use. (Author)

14. MATERIALS (NON-METALLIC)

AD-296 038 Div. 14
(TISTM/SJR) OTS price $1.60

Frick Chemical Lab., Princeton U., N. J.
VISCOELASTIC PROPERTIES OF PRESWOLLEN POLYMER NETWORKS IN THE TRANSITION REGION,
by A. V. Tobolsky and M. C. Shen. Jan 63, 7p. illus. 15 refs. (ONR Technical rept. no. RLT-56)
(Contract Nonr-185807, Proj. NR 356-377)
Unclassified report

DESCRIPTORS: *Elastomers, Acrylic resins, Styrene plastics, Mechanical properties, Temperature, Viscoelasticity.

Viscoelastic properties of preswollen polymethyl methacrylate and polystyrene in the transition region were studied by modulus-temperature measurements. Inflection temperatures and transition region slopes for a series of diluent contents were determined. They were found to be similar to those of plasticized polyvinyl chloride. (Author)

AD-296 051 Div. 14, 26, 27
(TISTM/ODN) OTS price $3.60

Aerojet-General Corp., Azusa, Calif.
DEVELOPMENT OF IMPROVED HIGH-STRENGTH PREIMPREGNATED MATERIALS FOR FILAMENT WINDING.
Summary rept., 26 June 61-1 Nov 62.
Dec 62, 16p. illus. tables (Rept. no. 2440)
(Contract NOw 61-0642-c)
Unclassified report

DESCRIPTORS: *Filament wound construction, *Glass textiles, Plastics, Mechanical properties, Tensile properties, High pressure research, Hydrostatic pressure, Stresses, Failure (Mechanics), Rocket cases, High temperature research, Materials, Impregnation.

AD-296 188 Div. 14
(TISTM/BRW) OTS price $11.50

Cornell Aeronautical Lab., Inc., Buffalo, N. Y.
INVESTIGATION OF THEORETICAL AND PRACTICAL ASPECTS OF THE THERMAL EXPANSION OF CERAMIC MATERIALS.
Final rept., Sep 60-July 62,
by Henry P. Kirchner, Howard A. Scheetz and others. July 62, 153p. incl. illus. tables, 72 refs. (Rept. no. P1-1273-M-12)
(Contract NOrd-18419)
Unclassified report

DESCRIPTORS: *Ceramic materials, Measurement, Theory, Crystal structure, Aluminum compounds, Barium compounds, Beryllium compounds, Calcium compounds, Magnesium compounds, Iron compounds, Lithium compounds, Sodium compounds, Zirconium compounds, Oxides, Silicates, Silicon compounds, Thermal expansion.

Several methods were used to predict the thermal expansion coefficients of pure, single-phase ceramics. The predictions were extended to cover 1700 pure phases. Based upon these calculations a number of phases, predicted to have low values of thermal expansion coefficient, were synthesized and the thermal expansion properties of these materials were measured. Several of these were found to be low-expansion materials. The thermal expansion properties of cubic UP2O7 are particularly interesting. This material expands with increasing temperature up to about 400 C. Above this temperature the crystal contracts, returning to its room temperature length at about 1000 C. These properties are believed to be unique. Variation of the thermal expansion anisotropy by addition of solid solution atoms to several base crystals was attempted. Addition of vanadium to rutile (TiO_2) resulted in a significant decrease in thermal expansion anisotropy. Vanadium additions to cassiterite (SnO_2) which has the same structure as rutile, also caused a significant decrease in thermal expansion anisotropy. (Author)

AD-296 269 Div. 14
(TISTM/RGR) OTS price $2.60

Research and Advanced Development Div., AVCO Corp., Wilmington, Mass.
MICROSTRUCTURE STUDIES OF POLYCRYSTALLINE REFRACTORY OXIDES.
Quarterly progress rept. no. 2,
by T. Vasilos, R. M. Spriggs, and J. B. Mitchell. 14 Feb 63, 18p. incl. illus. 14 refs. (Rept. no. RAD-SR-63-29)
(Contract Now 62-0648-c)
Unclassified report

DESCRIPTORS: *Refractory materials, *Aluminum compounds, *Magnesium compounds, *Oxides, Microstructure, Grain structures, Ceramic materials, Density, Porosity, Failure (Mechanics), High-temperature research, Crystals, Phase studies, Tensile properties.

Transverse bend strength and elastic modulus determinations made of fine-grained (1 to 2 micron), dense, pure Al_2O_3 and MgO specimens as a function of temperature (up to 1350 C) revealed values higher than those obtained by other investigators for these oxides in more porous form and of larger grain sizes. Studies of the grain growth kinetics of alumina and magnesia were conducted in order to obtain information to enable preparation of specimens with desired larger grain sizes for subsequent thermomechanical testing. Based on observations of the fracture modes exhibited by alumina and magnesia as a function of temperature, it was suggested that anelastic deformation or possible plastic flow in the so-called equicohesive temperature range may influence the mode of fracture. By analogy with findings in metals systems, it was hypothesized that the apparent transition from transgranular to intergranular fracture might occur below some critical stress rather than above some critical temperature. (Author)

AD-296 270 Div. 14, 22
(TISTM/EJH) OTS price $1.60

Aerofab Co., Inc., Ferndale, Mich.
A TECHNOLOGICAL SURVEY OF VISION BLOCK MATERIALS AND DESIGN,
by R. M. Eckerman. Oct 62, 14p. illus.
(Contract DA 20-018-ORD-23389)
Unclassified report

DESCRIPTORS: *Laminated glass, *Bulletproof glass, *Laminated plastics, Armored vehicles, Ballistics, Glass, Elastomers, Rubber adhesives.

Limited firings indicate that materials commercially available for use as ballistic windows are not appreciably better than the laminated glass and the plastic vision blocks covered by Type I and Type II of Specification MIL-B-11352B. Plastic blocks without exterior and interior glass faces are not adequate for stopping AP

projectiles from either 0.30 - or 06 or NATO 0.762 weapons. None of the vision blocks of the above specification, or as modified in this endeavor, offers protection for more than one shot. If the 2nd shot falls with the major destructive area of the 1st shot, either penetration or secondary fragmentation will result. Residual vision after the first shot depends on the location of impact. In most cases monocular vision area will remain. For practical purposes 100% destruction of the vision area will result from a 2nd shot. Inasmuch as the probability of projectile impact is a direct function of target size, it follows that the size of the vision block should be as small as possible for binocular vision. (Author)

AD-296 283 Div. 14, 7, 8
(TISTM/BRW) OTS price $2.60

Clevite Corp., Cleveland, Ohio.
FAILURE MECHANISMS IN CERAMIC DIELECTRICS.
Quarterly technical note no. 3,
by D. Berlincourt. 17 Oct 62, 21p. incl. illus. table, refs.
(Contract AF 30(602)2594, Proj. 5519)
(RADC TDR 62-633) Unclassified report

DESCRIPTORS: *Ceramic capacitors, *Dielectrics, *Ceramic materials, Lead compounds, Barium compounds, Strontium compounds, Preparation, Titanates, Zirconates, Niobium compounds, Electrical properties, Failure (Mechanics), Synthesis.

AD-296 341 Div. 14, 17, 26
(TISTM/BRW) OTS price $9.60

Thompson Ramo Wooldridge, Inc., Cleveland, Ohio.
DESIGN DATA STUDY FOR COATED COLUMBIUM ALLOYS.
Final summary technical rept., 21 Dec 61-21 Dec 62,
by J. D. Gadd. 21 Jan 63, 114p. incl. illus. tables (Rept. no. ER-5185)
(Contract NOw 62-0098-c)
Unclassified report

DESCRIPTORS: *Niobium alloys, *Sheets, Refractory coatings, High temperature research, Tantalum alloys, Tungsten alloys, Zirconium alloys, Design, Data, Space craft, Re-entry vehicles, Coatings, Mechanical properties.

Design data properties were determined for two protective coating-columbium alloy systems involving Pfaudler and TRW oxidation protective coatings on Fansteel-85 columbium alloy up to temperatures of 2600 F. Prior to the design data study, preliminary screening oxidation, bend and prestrain tests were conducted on seven oxidation protective coatings applied to D-14 and FS-85 columbium alloys. Based on the screening test results, Pfaudler and TRW coatings were selected for the mechanical properties evaluation. The following design properties were determined for uncoated and Praudler and TRW coated 30 mil FS-85 alloy sheet: (a) coating cyclic oxidation protective life, (b) tensile properties of uncoated (in vacuum) and coated (in air) sheet, (c) coating deformation tolerance and (d) stress rupture properties of coated sheet (in air). (Author)

AD-296 351 Div. 14
(TISTM/BRW) OTS price $8.10

Lockheed Aircraft Corp., Sunnyvale, Calif.
METAL BORIDES, CARBIDES AND NITRIDES, AND COMPLEMENTARY REFRACTORIES: AN ANNOTATED BIBLIOGRAPHY, comp. by Jack B. Goldmann. Oct 62, 86p. 202 refs. (Special bibliography no. SB-62-32; Rept. no. 3-80-62-21)
Unclassified report

DESCRIPTORS: *Refractory materials, *Bibliography, Metals, Borides, Carbides, Nitrides.

The metal borides, carbide and nitrides and complementary refractories which are related to the field of aerospace materials form the basis of this annotated bibliography. The references whicch are included appeared in print during the period January 1961-May 1962. Citations are arranged alphabetically by author. (Author)

AD-296 375 Div. 14
(TISTM/ODN) OTS price $11.50

Manchester U. (Gt. Brit.).
MECHANICAL BEHAVIOUR OF TWISTED YARNS. 1. FATIGUE BEHAVIOUR OF TWISTED CONTINUOUS FILAMENT YARNS. 2. GEOMETRIC STRUCTURE AND FORM OF YARNS.
Final technical rept., Oct 61-Oct 62,
by A. J. Booth, O. N. Bose, and J. W. S. Hearle. Oct 62, 1v. incl. illus. tables.
(Contract DA 91-591-EUC-1833)
Unclassified report

DESCRIPTORS: *Fibers, *Textiles, Tensile properties, Deformation, Fatigue (Mechanics), Recording systems, Tests, Test equipment, Test methods, Rubber, Calibration, Experimental data, Geometric forms, Mechanical properties.

AD-296 386 Div. 14, 20
(TISTM/SJR) OTS price $2.60

Ballistic Research Labs., Aberdeen Proving Ground, Md.
THE EFFECTS OF ALPHA PARTICLES ON LOW DENSITY POLYETHYLENE,
by Joe A. Swisher. Nov 62, 27p. incl. illus. tables, 14 refs. (Rept. no. 1177)
(Proj. 512-10-001)
Unclassified report

DESCRIPTORS: *Polyethylene plastics, *Alpha particles, *Radiation measurements, *Alpha particle detectors, *Infrared spectroscopy, *Radioactive isotopes, Calibration, Armed forces research, Radiation chemistry, Radiation damage, Polonium.

Polyethylene samples were exposed to two different size polonium-210 alpha sources for increasing durations of time. The resulting chemical changes were studied as a function of absorbed energy by means of infrared spectroscopy. The radiation induced chemical changes observed in the infrared spectra of the polymer resulted in an increase in absorption at the characteristic frequencies of the new chemical bonds. Two methods were used to correlate the analytical data with the alpha particle exposure. One method involves the characteristic infrared band frequencies and the other, a unique approach, the correlation of the integrated areas of the infrared spectra. The results indicate the potentiality of polyethylene as a detector for alpha particles and a calibration tool for polonium alpha sources in the range of one millicurie to one curie. (Author)

AD-296 444 Div. 14, 25
(TISTM/ODN) OTS price $3.60

Frick Chemical Lab., Princeton U., N. J.
RUBBER ELASTICITY OF PRESWOLLEN POLYMER NETWORKS,
by M. C. Shen and A. V. Tobolsky. Jan 63,
1v. incl. illus. tables, refs. (ONR Technical rept. no. RLT-57)
(Contract Nonr-1858(07), Proj. NR 356-377)
Unclassified report

DESCRIPTORS: *Polymers, Kinetic theory, Equations of state, Theory, Polymerization, Photochemistry, Acrylic resins, Stresses, Shear stresses, Experimental data, Torsion meters, Elasticity.

The rubber elasticity of lightly crosslinked preswollen polymers was studied by torsion measurements. The equation of state of rubber elasticity was applied to evaluate their front factors, which were found to decrease linearly as a function of increasing diluent content. This relation is independent of the crosslinker and the diluent used, provided that the diluent exists in monomeric state. When polymeric diluents are used, the decrease of phi becomes much sharper. Properties of deswollen polymer networks were also investigated. Little change was observed before and after deswelling. These results are discussed in the light of the kinetic theory of rubber elasticity. (Author)

AD-296 487 Div. 14, 4
(TISTM/ODN) OTS price $1.60

Harris Research Labs., Washington, D. C.
ACCELERATED DETERIORATION OF TEXTILES.
Bimonthly progress rept. no. 11, 1 Dec 62-31 Jan 63,
by Charles A. Rader and Anthony M. Schwartz.
15 Feb 63, 7p. tables, 8 refs.
(Contract DA 18-108-cml-6606)
Unclassified report

DESCRIPTORS: *Cellulose, *Textiles, *Photochemistry, Sodium compounds, Nitrites, Nitrogen compounds, Oxides, Hydroxides, Cotton textiles, Ultraviolet radiation, Light, Tensile properties, Infrared spectroscopy, Degradation.

The photodegradation of cellulose containing sodium nitrite was studied further. To test a hypothesis that the reaction proceeds via a mechanism involving hydroxyl radicals or nitric oxide, these were investigated separately. Neither hydroxyl radicals nor nitric oxide was found as effective as sodium nitrite in accelerating the photodegradation. (Author)

AD-296 504 Div. 14
(TISTM/SJR) OTS price $8.60

Forest Products Lab., Madison, Wis.
LIST OF PUBLICATIONS ON MECHANICAL PROPERTIES AND STRUCTURAL USES OF WOOD AND WOOD PRODUCTS.
Dec 62, 79p. (Rept. no. 200)
(In cooperation with Wisconsin U., Madison)
Unclassified report

DESCRIPTORS: *Wood, *Bibliography, Laminates, Plywood, Processing, Deformation, Stresses, Fatigue (Mechanics), Creep, Loading, Impregnation, Test methods, Mechanical properties.

AD-296 505 Div. 14, 26
(TISTM/EJH) OTS price $2.60

Forest Products Lab., Madison, Wis.
MODIFIED WOODS,
by R. M. Seborg, Harold Tarkow, and A. J. Stamm.
Nov 62, 30p. incl. illus. table, 59 refs. (Rept. no. 2192)
(In cooperation with Wisconsin U., Madison)
Unclassified report

DESCRIPTORS: *Wood, *Processing, *Organic compounds, *Benzene, Coatings, Impregnation, Plastics, Chemicals, Stability, Mechanical properties, Compressive properties, Hydroxyl mercapto radicals, Additives.

AD-296 506 Div. 14
(TISTM/ODN) OTS price $1.10

Forest Products Lab., Madison, Wis.
EFFECT OF TEMPERATURE AND RESTRAINT DURING DRYING ON THE TENSILE PROPERTIES OF HANDSHEETS,
by Vance C. Setterholm, Warren A. Chilson, and A. T. Luey. Dec 62, 6p. incl. illus. table.
(Rept. no. 2265)
(In cooperation with Wisconsin U., Madison and Boxboard Research and Development Assoc., Kalamazoo, Mich.)
Unclassified report

DESCRIPTORS: *Paper, *Wood pulp, Elasticity, Stresses, Temperature, Sheets, Test methods, Failure (Mechanics), Test equipment, Dehydration, Tensile properties.

Handsheets prepared from a bleached southern pine kraft pulp were dried at 73, 150, and 200F under four degrees of restraint. Analysis of stress-strain data from tension tests revealed that increasing either drying temperature or restraint during drying increased the tensile properties, and that restraint had the greater effect on modulus of elasticity, tensile strength, and stretch. (Author)

AD-296 594 Div. 14, 32
(TISTM/SJR) OTS price $4.60

Lockheed Aircraft Corp., Sunnyvale, Calif.
THERMAL PROPERTIES OF WOOD: AN ANNOTATED BIBLIOGRAPHY,
comp. by Jack B. Goldmann. Sep 62, 42p. 17 refs.
(Special bibliography no. SB 62-28; Rept. no. 3-80-62-17)
Unclassified report

DESCRIPTORS: *Wood, *Bibliographies, High temperature research, Processing, Plywood, Laminates, Fire resistant coatings, Heat treatment.

AD-296 796 Div. 14
(TISTM/RGR) OTS price $1.10

Naval Civil Engineering Lab., Port Hueneme, Calif.
A STUDY OF THE EFFECTIVENESS OF FUEL-OIL ADDITIVES IN USE IN THE ELEVENTH NAVAL DISTRICT.
Final rept.,
by J. S. Williams. 27 Nov 62, 8p. (Technical rept. no. R 235)
(Proj. Y-F015-99-014) Unclassified report

DESCRIPTORS: *Oil tanks, *Fuel oils, Boilers, Combustion, Catalysts, Power plants, Effectiveness, Maintenance, Additives.

Division 15 - MATHEMATICS

A survey was conducted at a number of heat-plant installations at bases in the Eleventh Naval District to determine the need for the use of additives to prevent sludge in No. 6 fuel-oil storage tanks. The fact that no sludging problems could be found at bases not using an additive indicated that a need did not exist. Several of the facilities reported that additives decreased the formation of soot by improving the combustion. A test was made to check the validity of these claims. An additional test without additive showed that changes in operating schedules would also reduce soot accumulation. It was concluded that no requirement exists for additives for sludge prevention. It was further concluded that combustion catalysts are beneficial for boilers operating under intermittent and cycling conditions, but that no substantial benefit results from the use of catalysts when boilers are operated continuously. (Author)

AD-296 811 Div. 14, 26
(TISTM/ODN) OTS price $2.60

Quantum, Inc., Wallingford, Conn.
DEVELOPMENT OF TREATMENTS PRODUCING LOW-FRICTION SURFACES ON ELASTOMERS.
Technical progress rept. no. 7, 15 Aug-14 Nov 62,
by Robert M. Reihsmann. 14 Nov 62, 26p.
(Contract NObs-84503, Proj. R-007-03-03)
Unclassified report

DESCRIPTORS: *Elastomers, *Synthetic rubber, Friction, Fluorination, Rubber, Processing, Boron compounds, Fluorides, Sulfur compounds, Elasticity, Tensile properties, Rubber seals, Tests, Butyl rubber, Surfaces.

Work done is leading to the optimization of two methods of treatment and treatment of samples for in-use or simulated in-use testing. Descriptions of the treatments of samples listed below are included in the report. Water lubricated shaft bearings for U.S. Navy Engineering Experiment Station, Retractable mast seals (chevron) for Portsmouth Naval Shipyard, B138 and B142 experimental compounds from Puget Sound Naval Shipyard, Four inch ID Buna-N butterfly valve liners. (Author)

AD-296 822 Div. 14, 4
(TISTM/SJR) OTS price $1.60

Rock Island Arsenal Lab., Ill.
SYNTHESIS OF SILCARBANE POLYMERS USING CONVENTIONAL AND RADIATION INITIATION.
Technical rept.,
by Ronald R. Freeman. 14 Dec 62, 20p. incl. tables, 17 refs. (Rept. no. 62-4162)
(Proj. 599-25-001)
Unclassified report

DESCRIPTORS: *Elastomers, *Silicon compounds, *Silanes, Heat-resistant plastics, Grignard reagents, Vinyl plastics, Hydrides, Aluminum compounds, Lithium compounds, Armed forces research, Synthesis, Polymers.

Results are presented on the synthesis of silcarbane polymers from (1) diolefin silanes and silicon dihydrides initiated by platinum catalysts or gamma radiation, (2) divinyldimethylsilane using emulsion techniques with peroxide, metal and metal salts initiation, and (3) silicon dihydrides and 1,6 heptadiyne initiated by chloroplatinic acid. Silcarbane polymers prepared by the diolefin/dihydride reaction were low molecular weight (inherent viscosities ranged from 0.02-0.10) liquids to brittle solids. Benzene soluble powders, in low yields, were obtained in the emulsion polymerization of divinyldimethylsilane. Viscous liquids to rubbery polymers (inherent viscosities ranged from 0.05-0.40) resulted from the polymerization reactions of silicon dihydrides with 1,6 heptadiyne. The elastic gums were cured using conventional curatives or gamma radiation. (Author)

AD-296 918 Div. 14, 4
(TISTM/ODN) OTS price $1.10

Smith, A. O., Corp., Milwaukee, Wis.
GLASS SURFACE CHEMISTRY FOR GLASS FIBER REINFORCED PLASTICS.
Monthly progress rept. no. 11, 1-31 Jan 63 on Effect of Glass Surface Chemistry on Wetting, Bond Strength and Bond Life of an Epoxy Resin.
15 Feb 63, 5p. incl. illus. table, 2 refs.
(Contract NOw 62-0679-c)
Unclassified report

DESCRIPTORS: *Glass textiles, *Plastics, Glass, Surface-active substances, Surfaces, Bonding, Failure (Mechanics), Life expectancy, Reinforcing materials.

A test for measuring the glass-to-resin bond strength in a dry environment appeared capable of distinguishing changes in the glass surface chemistry. The test indicated that the coupling agent A-1100 slightly improved the bond strength. An attempt will be made to correlate optically flat and as-cast glass surfaces with respect to bond life, bond strength, and wetting. Bond life studies in 100% relative humidity showed this environment to be almost as severe as immersion in water. Optical polishing changes the glass surface both physically and chemically. The significance of differences between the optically polished and virgin as-cast glass surface has not been established. Studies using a sample having an optically flat glass surface instead of the slightly curved as-cast surface would be simpler, particularly when measuring bond strength. (Author)

15. MATHEMATICS

AD-296 041 Div. 15, 32
(TISTP/MB) OTS price $1.60

California U., Berkeley.
LINEAR PROGRAMMING UNDER UNCERTAINTY IN AN L SPACE,
by Charles S. Fisher. Dec 62, 11p. 6 refs.
(Technical rept. no. 7)
(Contract Nonr-22277, Proj. NR 047-029)
Unclassified report

DESCRIPTORS: *Linear programming, Probability, Games theory, Operations research, Economics, Functional analysis.

AD-296 117 Div. 15
(TISTW/JEA) OTS price $2.60

Applied Mathematics and Statistics Labs., Stanford U., Calif.
A NEW DERIVATION OF THE EQUATIONS OF ALREADY-UNIFIED FIELD THEORY,
by Menahem Schiffer and Ronald Adler. 18 Jan 63, 26p. 3 refs. (Technical rept. no. 114)
(Contract Nonr-22511, Proj. NR-041-086)
Unclassified report

DESCRIPTORS: *Tensor analysis, *Relativity theory, *Matrix algebra, Topology, Transformations (Mathematics), Energy, Operators (Mathematics), Gravity, Geometric forms, Electromagnetic fields, Functions, Differential equations, Polynomials, Electromagnetism, Analysis, Theory.

The algebraic Rainich conditions and the differential relations of Wheeler and Misner which form the basis of the already-unified field theory are usually obtained from the Einstein-Maxwell system of equations by rather laborious tensor analysis. These results are obtained by utilizing classical matrix theory and a special local coordinate system. (Author)

AD-296 155 Div. 15
(TISTP/MB) OTS price $2.60

Laboratory of Statistical Research, U. of Washington, Seattle.
TWO SIMPLE DISTRIBUTION-FREE TESTS OF GOODNESS OF FIT,
by Z. W. Birnbaum and Victor Kuang-Tao Tang.
Nov 62, 24p. incl. illus. tables, 4 refs. (Technical rept. no. 40)
(Contract Nonr-47711)
Unclassified report

DESCRIPTORS: *Statistical data, Statistical functions, Statistical analysis, Statistical tests.

AD-296 163 Div. 15
(TISTW/JEA) OTS price $8.60

Massachusetts Inst. of Tech., Cambridge.
REPRESENTATION SCHEMES FOR INVESTIGATING NONLINEAR PROCESSES,
by Donald B. DeVorkin. Dec 62, 92p. 20 refs.
(Scientific rept. no. 1)
(Contract AF 19(604)4969, Proj. 8628)
(AFCRL 62-1137) Unclassified report

DESCRIPTORS: *Differential equations, *Fluid mechanics, *Fluid flow, *Nonlinear systems, *Nonlinear differential equations, Correlation technique, Complex variables, Operators (Mathematics), Tensor analysis, Viscosity, Vortices, Matrix algebra, Transformations (Mathematics), Functions, Series, Turbulence, Statistical processes, Analysis, Statistical analysis, Distribution.

Research is concerned with systems of ordinary differential equations. A framework is developed in which a statistical approach to the analysis of the equations is natural. One seeks the correlations of the solution in terms of the correlations of initial conditions and/or forcing functions. General representation schemes are developed for this purpose. It is shown that general schemes can converge for arbitrarily large but finite time. In some special cases, all-time representations are obtained. (Author)

AD-296 171 Div. 15
(TISTP/TL) OTS price $8.10

Minnesota U., Minneapolis.
BAYES DECISION THEORY: INSENSITIVITY TO NON-OPTIMAL DESIGN,
by Gordon R. Antelman. 3 Oct 62, 77p. incl. 10 refs. (Technical rept. no. 16)
(Contract Nonr-71031, Proj. NR 0420-003)
Unclassified report

DESCRIPTORS: *Probability, *Statistical processes, *Statistical distribution, Inequalities, Equations, Numerical analysis, Real variables, Binomials, Sequences, Sampling, Theory, Costs.

AD-296 220 Div. 15
(TISTP/MB) OTS price $3.60

Case Inst. of Tech., Cleveland, Ohio.
BEST LINEAR UNBIASED ESTIMATION OF LOCATION AND SCALE PARAMETERS OF WEIBULL DISTRIBUTION USING ORDERED OBSERVATIONS,
by Zakkula Govindarajulu and Madhukar Joshi.
Nov 62, 37p. incl. tables, 19 refs. (Case Statistical Lab. pub. no. 102)
(Grant no. AFOSR 62-72)
Unclassified report

DESCRIPTORS: *Statistical data, *Sampling, Analysis of variance, Statistical analysis, Statistical distributions.

Best linear unbiased estimation of location and scale parameters of the Weibull distributions using ordered observations of a random sample is considered. It is assumed that the shape parameter of the Weibull distribution is known. For sample sizes up to and including five, all possible censoring is considered. For sample sizes greater than five, one-sided censoring (that is, large values of the sample are missing) is considered. The coefficients are presented. (Author)

AD-296 221 Div. 15
(TISTP/MB) OTS price $4.60

Case Inst. of Tech., Cleveland, Ohio.
PERCENTILE POINTS OF ORDER STATISTICS IN SAMPLES FROM BETA, NORMAL, CHI (1 D.F.) POPULATIONS,
by Zakkula Govindarajulu and Nicholas W. Hubacker. Nov 62, 41p. incl. tables (Case Statistical Lab. pub. no. 101)
(Grant no. AFOSR 62-72)
Unclassified report

DESCRIPTORS: *Sampling, *Statistical analysis, Probability, Polynomials, Numerical analysis, Statistical distributions, Tables.

AD-296 280 Div. 15
(TISTP/MB) OTS price $3.60

Boeing Scientific Research Labs., Seattle, Wash.
STUDIES IN GENERALIZED RANDOM WALKS. II. THE EXPECTED FIRST PASSAGE TIME,
by A. William Kratzke. Nov 62, 28p. (Mathematical note no. 279; Document no. D1-82-0213)
Unclassified report

Also available from the author.

DESCRIPTORS: *Particles, Absorption, Statistical analysis, Numerical analysis, Numerical methods and procedures, Statistical processes, Statistical functions, Probability, Analysis, Statistical distributions.

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AD-296 384 Div. 15
(TISTP/JW) OTS price $11.00

Aeronautical Chart and Information Center, St. Louis, Mo.
HARMONIC ANALYSIS,
by Charles Weiss. Feb 62, 142p. refs. (ACIC reference publ. no. 14)
Unclassified report

DESCRIPTORS: *Fourier analysis, *Harmonic analysis, Equations, Surfaces, Special functions, Theory.

An equation to represent a curve or a set of points is often necessary. Some methods for finding these representations are discussed. Fourier series affords a practical technique for harmonic analysis in two dimensions. Part I develops the theory of the representation of a curve by a Fourier series. Conditions necessary to justify the representation are mentioned and a procedure for finding the Fourier series is outlined. Spherical harmonics is the simplest method of harmonic analysis in three dimensions. The basic theory is developed in Part II. (Author)

AD-296 411 Div. 15
(TISTP/MB) OTS price $3.60

Northeastern U., Boston, Mass.
EXAMPLES OF P.D.F.'S OF SUMS AND PRODUCTS,
by Sze-Hou Chang and Lih-Jyh Weng. Sep 62, 39p. incl. illus. (Scientific rept. no. 2)
(Contract AF 19(604)7494 and Grant AF-AFOSR 62-371)
(AFCRL 62-795) Unclassified report

DESCRIPTORS: *Probability, Statistical distributions, Statistical analysis, Statistical functions.

AD-296 495 Div. 15, 32
(TISTP/TL) OTS price $2.60

Institute of Mathematical Sciences, New York U., N. Y.
ON THE COMBINATION OF INDEPENDENT TWO SAMPLE TESTS OF A GENERAL CLASS,
by M. L. Puri. Jan 63, 26p. incl. illus. 14 refs. (Rept. no. IMM-NYU 306)
(Contract Nonr-28538; In cooperation with California U., Berkeley, Contract Nonr-22243)
Unclassified report

DESCRIPTORS: *Statistical tests, Statistical distribution, Statistical function, Errors, Population, Sampling.

AD-296 529 Div. 15
(TISTP/GRW) OTS price $4.60

Applied Mathematics and Statistics Labs., Stanford U., Calif.
CONDITIONED LIMIT THEOREMS,
by Meyer Dwass and Samuel Karlin. 21 Jan 63, 41p. 26 refs. (Technical rept. no. 34)
(Contract Nonr-22528, Proj. NR-047-019)
Unclassified report

DESCRIPTORS: *Statistical processes, Functional analysis, Integral transforms, Theory.

Limit theorems for Markoff processes and suitable functionals defined on the processes occur in two principal contexts. The first context treats a situation where the limit process is one of the classical stable processes. The usual approximating processes are sums of independent random variables. A second class of examples is that of a limit diffusion process of Bessel type. Then the approximating processes may themselves either be of diffusion type (i.e., random walks, birth and death or bona fide diffusion) or processes almost of diffusion type. In both cases under sufficient regularity conditions, there exists an invariance principle, i.e., the convergence of the processes entails the convergence in law of functionals continuous a.e. with respect to the limit process. The objective is to develop several limit laws for random variables subject to conditioning on a recurrent event. (Author)

AD-296 599 Div. 15
(TISTP/GRW) OTS price $1.60

Johns Hopkins U., Baltimore, Md.
THE USE OF THE GOVERNING EQUATIONS IN DIMENSIONAL ANALYSIS,
by Robert R. Long. Jan 63, 12p. incl. illus. 5 refs. (Technical rept. no. 13(ONR Series); Technical rept. no. 16(CWB Series))
(Contracts Nonr-24831, Proj. NR 082-104 and CWB-10204)
Unclassified report

DESCRIPTORS: *Fluid mechanics, Dynamics, Mathematical analysis, Sources, Control, Mathematics.

An idea is developed that the most effective use of dimensional analysis in fluid mechanics is to combine it with the known mathematical form of the governing equations. It is shown that additional information can frequently be obtained in this way, especially when physical approximations can be reasonably made. (Author)

AD-296 787 Div. 15, 19
(TISTW/JEA) OTS price $4.60

Lincoln Lab., Mass. Inst. of Tech., Lexington.
OPTIMUM INCORPORATION OF EXTERNAL OBSERVATIONS WITH A MARINE INERTIAL NAVIGATION SYSTEM,
by D. J. Sakrison. 30 Nov 62, 38p. incl. illus. 7 refs. (Technical rept. no. 289)
(Contract AF 19(628)500)
(AFESD TDR 62-273) Unclassified report

DESCRIPTORS: *Inertial navigation, *Guided missile tracking systems, *Data processing systems, *Equations, *Errors, Position finding, Measurements, Statistical analysis, Taylor's series, Navigation, Vector analysis, Velocity, Transformations (Mathematics), Differential equations, Matrix algebra, Difference equations, Digital computers, Functions, Statistical functions, Statistical process, Factor analysis, Shipborne, Navigation computers, Propagation, Mathematical analysis.

AD-296 789 Div. 15, 25
(TISTP/JW) OTS price $1.10

Lincoln Lab., Mass. Inst. of Tech., Lexington.
A THEOREM ON FOURIER INTEGRALS AND AN APPLICATION TO THE THEORY OF MEASUREMENT IN QUANTUM MECHANICS,
by Harry E. Moses. 5 Feb 63, 5p. 2 refs. (Rept. no. 37 G-1)
(Contract AF 19(628)500)
(AFESD TDR 63-19) Unclassified report

DESCRIPTORS: *Fourier analysis, *Quantum mechanics, Probability (Mathematics), Functions, Distribution, Integrals, Measurement.

It is shown that a complex function of one real variable is determined uniquely up to a constant phase factor by its absolute value and the absolute values of Fourier transforms of the function and certain related functions. An application is given to the determination of the state function in quantum mechanics from the measurements of certain probability distributions of position and momentum. (Author)

AD-296 795 Div. 15
(TISTP/MB) OTS price $2.60

Naval Ordnance Lab., White Oak, Md.
A GENERALIZED BOUNDARY VALUE PROBLEM FOR uxy EQUALS f(x,y,u,u sub x, u sub y),
by James Conlan. 17 Oct 62, 18p. 5 refs.
(NOLTR 62-177)

Unclassified report

DESCRIPTORS: *Mathematics, Differential equations, Sequences, Functions, Inequalities, Partial differential equations.

This paper proves an existence theorem for the partial differential equation u sub xy equals f(x,y,u,u sub x, u sub y) with certain linear combinations of u, u sub x and u sub y given on two non characteristic curves. (Author)

AD-296 798 Div. 15
(TISTP/WH) OTS price $2.60

Naval Postgraduate School, Monterey, Calif.
GRAPHICAL FOURIER OPERATIONS,
by Roy M. Johnson, Jr. Oct 62, 24p. (Research paper no. 31)

Unclassified report

DESCRIPTORS: *Fourier analysis, Numerical methods and procedures.

The graphical, symbolic function method of evaluating the discrete or continuous Fourier spectrum of a function is proved by use of symbolic analysis. After a review of pertinent symbolic function theory, the method is illustrated for several problems including the non-finite polynomial function case. (Author)

AD-296 818 Div. 15, 32
(TISTW/JEA) OTS price $1.10

RAND Corp., Santa Monica, Calif.
AGGREGATION AND MULTIPLICATIVE PRODUCTION FUNCTIONS,
by Benton F. Massell. Feb 63, 7p. (Rept. no. P-2702)

Unclassified report

DESCRIPTORS: *Industrial production, *Production, *Economics, Industries, Statistical distribution, Statistical processes, Consumption, Commerce, Costs, Money, Labor, Machines, Probability, Measurement, Processing, Functions, Statistical analysis, Distribution, Theory.

Consider a sector of the economy composed of several fully integrated industries, producing final products only. Write the sectoral production function (1) $Q(t) = A(t)K(t)\ L(t)^{1-}$, where Q = output, K = capital input, L = labor input, t = time, and A is a technology parameter. Further, let the production function for industry i be written (2) $Q_i(t) = A_i(t)K_i(t)^{\ i}\ L_i(t)^{1-\ i}$.

Now, the percentage rate of technical change -- what Domar terms the ''Residual'' -- for the sector can be expressed (3) $\frac{A}{A} = \frac{Q}{Q} - \frac{K}{K} - (1-)\frac{L}{L}$, and similarly for an industry. The problem, then, is to find a method for weighting and aggregating the industry production functions which leaves the rate of technical change invariant with respect to aggregation. Professor Domar's solution is to raise both sides of (2) to the v_i power, where $v_i = \frac{Q_i}{Q}$, and to multiply industry production functions together to obtain the sector function. (Author)

AD-296 825 Div. 15
(TISTP/GRW) OTS price $1.60

Rutgers U., New Brunswick, N. J.
ADDENDUM TO TECHNICAL REPORT NO. N-4,
by D. Hogben, R. S. Pinkham, and M. B. Wilk.
Dec 62, 13p. incl. tables, 3 refs. (Technical rept. no. N-10, Addendum to technical rept. no. 4, AD-262 447)
(Contract Nonr-40416)

Unclassified report

DESCRIPTORS: *Statistical distributions, Statistical data, Tables.

AD-296 829 Div. 15
(TISTP/MB) OTS price $3.60

Applied Mathematics and Statistics Labs., Stanford U., Calif.
FUNCTION ALGEBRAS,
by H. L. Royden. 21 Jan 63, 34p. 76 refs.
(Technical rept. no. 21)
(Grant DA ARO(D)31-124-G80)
(AROD rept. no. 1323:24)

Unclassified report

DESCRIPTORS: *Mathematics, Algebraic topology, Functions, Complex variables, Complex numbers, Convex sets, Polynomials, Algebras.

One of the principal purposes is to give a general treatment of function algebras. Another purpose is to illustrate the application of methods from the theory of functions of several complex variables to derive results about non-self adjoint function algebras. (Author)

AD-296 838 Div. 15, 25
(TISTP/MB) OTS price $3.60

System Development Corp., Santa Monica, Calif.
QUEUING WITH RENEGING AND MULTIPLE HETEROGENEOUS SERVERS,
by C. J. Ancker, Jr. and A. V. Gafarian.
21 Jan 63, 35p. incl. illus. 8 refs. (Rept. no. SP-372/000/01)

Unclassified report

DESCRIPTORS: *Operations research, Probability, Statistical analysis, Queueing theory.

A Poisson stream of items arrive at a multiple parallel serving facility consisting of s heterogeneous servers. Each entering item has a definite length of time it will wait in queue before reneging. This time is a random variable with negative exponential density function. If on arrival more than one server is free, the server to be used is chosen at random. The results obtained are for steady state and

include (1) state probabilities; (2) the probability of j or more in system, j=s, s+1,..., s+N; (3) mean number in queue and system and mean number of busy servers; (4) probability that an arrival acquires service; (5) mean rate of loss due to balking and reneging; and (6) density functions and mean values of waiting times in queue for those who are served, those who renege, and all who enter. (Author)

AD-296 892 Div. 15, 2
(TISTP/MB) OTS price $8.60

Aeronautical Chart and Information Center, St. Louis, Mo.
ERROR ANALYSIS BY THE COVARIANCE METHOD,
by Melvin E. Shultz and Donald A. Richardson. Jan 63, 94p. incl. illus. 12 refs. (ACIC Reference pub. no. 16)
Unclassified report

DESCRIPTORS: *Errors, *Geodesics, Statistical data, Analysis of variance, Correlation techniques, Least squares method, Statistical distribution, Statistical functions, Matrix algebra, Real variables, Probability, Data.

The analysis of dependent errors makes use of the concept of distribution moments and the moment matrix (covariance matrix). This paper presents an analysis of the normal bivariate and trivariate error distributions along with their relationships to the moment matrix, and the application of this concept to least squares and adjustments. It is shown that a suitable transformation of the covariance matrix yields independent errors which may be substituted for the dependent errors in further error analysis. A brief introduction to matrix properties is also included for background information. (Author)

AD-296 925 Div. 15, 25
(TISTW/JEA) OTS price $1.60

RAND Corp., Santa Monica, Calif.
A NOTE ON NONLINEAR SUMMABILITY TECHNIQUES IN INVARIANT IMBEDDING,
by Richard Bellman and Robert Kalaba. Feb 63, 12p. incl. illus. tables, 18 refs. (Memo. RM-3397-PR)
(Contract AF 49(638)700, Proj. RAND)
Unclassified report

DESCRIPTORS: *Linear programming, *Radioactivity, Reflection, Thickness, Functions, Differential equations, Time, Sequences, Series, Distribution, Radiation effects, Nonlinear systems, Control, Analysis, Diffusion, Transport properties.

The use of principles of invariance, as in invariant imbedding and dynamic programming, leads characteristically to functional equations of the form $f_{n+1}(p) = T_n(f_n(g(p)))$, $n = 0,1,2,\ldots$, where $f_0(p)$ is known. The computational solution proceeds stagewise, with f_1 determined from a knowledge of f_0, f_2 determined by f_1, and so on. In general, what is desired is the transient behavior, small n, and the steady-state, or asymptotic behavior as $n \to \infty$. In a number of significant processes--radiative transfer, control theory, inventory theory, and Markovian decision processes in general--only the asymptotic results are of interest. This is also the case in the application of gradient techniques. The application of nonlinear summability techniques to radiative transfer is outlined. (Author)

AD-296 970 Div. 15, 25, 20
(TISTW/JEA) OTS price $2.60

Uppsala U. (Sweden).
EIGENVALUES OF FERMION DENSITY MATRICES,
by Fukashi Sasaki. 1 May 62, 18p. refs. (Technical note no. 77)
(Contract AF 61(052)351)
(ARL 62-470) Unclassified report

DESCRIPTORS: *Functions, *Matrix algebra, *Wave transmission, *Nuclear particles, *Particles beams, Integral transforms, Operators (Mathematics), Integrals, Sequences, Energy, Theory, Particles, Continuum mechanics, Atomic energy levels, Density.

The least upper bound of the eigenvalues of second order density matrices for a system of fermions is proved to be n for a system of 2n or 2n+1 identical fermions. It is also shown that this limiting state may be interpreted as a system of n identical pairs behaving as quasi-bosons. (Author)

16. MEDICAL SCIENCES

AD-296 019 Div. 16
(TISTB/MD) OTS price $1.10

Michigan U. School of Dentistry, Ann Arbor.
AN ELECTROMYOGRAPHIC STUDY OF THE ORAL AND FACIAL MUSCULATURE.
Progress rept. for 1 Jan-31 Dec 62,
by Robert E. Moyers and Sigurd P. Ramfjord. 31 Dec 62, 5p.
(Contract DA 49-007-md-721)
Unclassified report

DESCRIPTORS: *Dentistry, Physiology, Teeth, Prosthetics, Head, Mouth, Muscles, Training, Medical research.

Work has been concentrated in two primary areas: (a) the physiology of swallowing, and (b) the recording of jaw relationships during various physiologic functions, e.g. swallowing, without the use of an apparatus connected to the patient. Abnormal, as well as normal swallowing, was observed. Tongue training methods were devised to overcome tongue thrusting which gives rise to certain malocclusions and denture difficulties. (Author)

AD-296 045 Div. 16
(TISTB/CCH) OTS price $2.60

Space Sciences Lab., General Electric Co., Philadelphia, Pa.
RESULTS OF SOME EXPERIMENTS IN BIOCHEMICAL ELECTRICITY,
by J. J. Konikoff and L. W. Reynolds. Jan 63, 25p. incl. illus. 7 refs. (Rept. no. R63SD8)
Unclassified report

Presented at the Biochemical Fuel Cell Symposium sponsored by the Electrochemical Working Group of the Interagency Advanced Power Group, held at the RAND Corporation, 25 Sep 62, Santa Monica, Calif.

DESCRIPTORS: *Biochemistry, *Fuel cells, Algae, Bacteria, Electrical properties, Electric potential, Oxidation-reduction reaction, Chemical reactions, Electrodes.

A Biochemical Fuel Cell system consisting of algae and fecal bacteria produced 0.3V at 1.4 to 2.0 ma/sq ft. The biological mechanism was studied by using a simplified system which contained only one organism, Fleischmann's yeast. Electrical properties were evaluated by analyzing polarization curves. These curves show a power density of 0.66 w/sq ft and a current density of 2.2 amps/sq ft at 0.3 volts. Finally, the catalytic action of the platinum-black was investigated. Bioelectric Potential has been measured in rats by placing electrodes in different parts of the body. The electrical output has been evaluated as above and indicates a power output of 90 microwatts at a current of 300 microamperes. For this study the electrode geometric area was about 75 sq mm. A 500 kc sine wave oscillator was designed and constructed and has been operated from the energy obtained from Bioelectric Potential of a 200 gram rat with implanted electrode. (Author)

AD-296 063 Div. 16
(TISTB/MD) OTS price $3.60

Institute for Cooperative Research, Johns Hopkins U., Baltimore, Md.
ANNUAL COMPREHENSIVE REPORT 1 JANUARY 1962 - 31 DECEMBER 1962,
by Richard J. Jones and Michael P. McQuillen. Dec 62, 30p. incl. illus. tables, 23 refs.
Unclassified report

DESCRIPTORS: *Muscles, *Motor reactions, *Acetylcholinesterase, *Cholinesterase inhibitors, Drugs, Diseases, Conditioned reflexes, Neuromuscular transmission, Man, Motivation, Musculoskeletal system, Measurement, Performance tests, Servomechanisms, Control systems, Erythrocytes, Blood plasma, Cholinesterase, Chemical analysis, Radiometers, Inhibition, Tolerances (Physiology), Rats, Parasympathomimetic agents, Skeletal muscle relaxants, Acetylcholine, Cholines, Contraction, Pathology, Genetics, Toxic tolerances.

Contents:
Movement disorders due to drug and disease
Familial RBC cholinesterase defect
Titrimetric cholinesterase method
Anticholinesterase tolerance in man
Anticholinesterase tolerance in rats

AD-296 097 Div. 16, 4
(TISTM/RGR) OTS price $2.60

Queen's U., Belfast (Gt. Brit.).
KINETICS AND MECHANISMS OF TRYPSIN- AND THROMBIN-CATALYSED AND RELATED REACTIONS.
Technical rept. no. 1 (Final), 1 Mar 61-30 Sep 62,
by D. T. Elmore, E. F. Curragh and N. J. Baines. 30 Sep 62, 21p. illus.
(Contract DA 91-591-EUC-1686)
Unclassified report

DESCRIPTORS: *Thrombin, *Trypsin, *Amino acids, Exchange reactions, Hydrolysis, Stereochemistry, Surface-active substances, Bile, Enzymes, Peptide hydrolases, Reaction kinetics, Chemical reactions.

AD-296 156 Div. 16, 14
(TISTB/MD) OTS price $1.60

Army Prosthetics Research Lab., Walter Reed Army Medical Center, Washington, D. C.
FABRICATION OF BURN DRESSINGS FROM FOAMED ACRYLATE-AMIDE ELASTOMERS,
by Carl A. Nielson and Gerry N. Wixson. Nov 62, 9p. illus. tables (Technical rept. no. 6224)
(Proj. 6X59-01-001-04)
Unclassified report

DESCRIPTORS: *Surgical supplies, *Nitrogen, carbon, oxygen radicals, *Elastomers, Medical supplies, Dacron, Expanded plastics, Burns, Manufacturing methods.

Research leading to the fabrication of a burn dressing from a foamed acrylate-amide elastomer is reported. Factors involved in the preparation of the elastomer, foam, and burn dressing are discussed. The porosities of the foamed acrylate-amide elastomers with and without a layer of dacron cloth reinforcement are determined by a method described here. (Author)

AD-296 242 Div. 16
(TISTB/MS) OTS price $1.60

Naval Radiological Defense Lab., San Francisco, Calif.
ACCELERATED INDUCTION OF HEPATOMAS IN FAST NEUTRON IRRADIATED MICE INJECTED WITH CARBON TETRACHLORIDE,
by L. J. Cole and P. C. Nowell. 19 Nov 62, 16p. incl. illus. table, 30 refs. (Rept. no. NRDL-TR-596)
Unclassified report

DESCRIPTORS: *Neoplasms, *Fast neutrons, *Liver, Mice, Radiation effects, Dosage, Carbon compounds, Production, Pathology, Mitosis.

Young adult (C57L x A)F(1) hybrid mice received single whole body exposure to fission spectrum fast neutrons (165-306 rad). Subgroups then received single subcutaneous injections of CCl(4), given at 2, 12, 15, or 18 months post-irradiation. Control non-irradiated mice received a single injection of CCl(4). Other groups of mice were exposed to single 500 rad dose of 250 KVP X-rays. The incidence of hepatomas increased markedly in neutron-irradiated mice (19%) compared with X-irradiated mice (2%). In neutron-irradiated mice injected with CCl(4), hepatoma incidence attained a value of 61%, three times that in mice irradiated with neutrons only. In addition, marked pleomorphism and atypicality of liver cell nuclei was evident in almost all neutron-CCl(4) mice, but was observed in only 6 of 47 mice exposed to neutrons only. Of the small group which received CCl(4), but no irradiation, and sacrificed up to 22 months later, none exhibited hepatomas or nuclear abnormalities. CCl(4) seems to act as a promoting agent in liver carcinogenesis. These findings, and other data in the literature, support the concept that hepatoma induction is accelerated by the action of a specific proliferative stimulus on cells bearing a latent radiation-induced alteration. (Author)

AD-296 243 Div. 16
(TISTB/MS) OTS price $2.60

Visibility Lab., U. of Calif., San Diego.
CONTRAST THRESHOLDS AS A FUNCTION OF RETINAL POSITION AND TARGET SIZE FOR THE LIGHT-ADAPTED EYE,
by John H. Taylor. Mar 61, 20p. incl. illus. table, 11 refs. (SIO Ref. no. 61-10)
(Contract NObs-72092, Proj. S F001 05-01)
Unclassified report

DESCRIPTORS: *Thresholds (Physiology), *Target recognition, *Eye, *Targets, *Adaptation (Physiology), Visibility, Vision, Motion, Position finding.

Binocular visual thresholds for targets of several sizes occupying various positions in the visual field have been measured at photopic adaptation luminance. Circular targets of positive contrast were presented for 0.33 second, chosen as a duration typical of the dwell times used in normal visual search procedures. Four young male observers with normal vision were used as subjects for the experiment. The data, based on approximately 80,000 observations, exhibit the dependence of the visual contrast threshold upon target size and position. The findings of the study differ, as anticipated, from other data which relate to the case of very brief (10 millisecond) target flashes, and are believed more suitable than the latter for the construction of visibility lobes used in the prediction of sighting ranges. The roles of various factors such as retinal neuroanatomy and eye-movement have been suggested, and intercomparison between studies has been attempted in an effort to evaluate these factors as determinants of visual performance. (Author)

AD-296 261 Div. 16
(TISTB/MS) OTS price $1.60

Army Biological Labs., Frederick, Md.
PNEUMOMYCOSES,
by Ye. Ryzhkov. Jan 63, 15p. incl. illus. refs. (Trans. no. 710 from Bol'shaya Meditsinskaya Entsiklopediya 25, pp. 107-120, 1962)
Unclassified report

DESCRIPTORS: *Lungs, *Fungi, Diagnosis, Therapy, Pathology, Diseases.

The various forms of pneumomycoses and the clinical course, physical findings, X-ray picture, and outcome to be expected in each are described. The cultural characteristics of the respective fungi are also described. Distinction is made between primary pneumomycoses and secondary pneumomycoses. A brief discussion is given of the underlying conditions predisposing to the letter. The article deals for the most part only with the pulmonary lesions of these respective mycoses and reference is made to other articles for a fuller treatment of the clinical conditions as a whole. A brief discussion is given of the microscopic findings in the lesions of the various pneumomycoses and a few remarks are made on the differential diagnosis and treatment of these diseases. (Author)

AD-296 272 Div. 16
(TISTB/CCH) OTS price $1.10

Andean Inst. of Biology (Peru).
MYOGLOBIN CONTENT AND ENZYMATIC ACTIVITY OF HUMAN SKELETAL MUSCLE - THEIR RELATION WITH THE PROCESS OF ADAPTATION TO HIGH ALTITUDE,
by Baltazar Reynafarje. Nov 62, 8p. incl. tables, 14 refs.
(Contract AF 41(657)249, Proj. 7758)
(SAM TDR 62-89) Unclassified report

DESCRIPTORS: *Enzymes, *Muscles, *Hemoglobin, Adaptation (Physiology), Musculoskeletal system, Man, high altitude, Biochemistry.

Quantitative determinations of myoglobin were made in the sartorius muscle of healthy human subjects, native of sea-level and high-altitude areas. The specific activity of the reduced form of diphosphopyridine nucleotide oxidase (DPNH-oxidase), DPNH- and TPNH-cytochrome C reductases, transhydrogenase, and isocitric and lactic dehydrogenases were also examined. A significantly higher myoglobin concentration was found in the muscle of the high-altitude natives as compared with sea-level residents. The enzyme systems DPNH-oxidase, TPNH-cytochrome C reductase, and transhydrogenase similarly showed a significantly higher activity in altitude residents. It was concluded that the respiratory capacity of the muscle was apparently higher in natives living at high altitude than in those living at sea level. The enhanced enzymatic activity was probably related to the higher pigment content of the skeletal muscle. Results on myoglobin determinations in several other muscles from certain sea-level patients are discussed. (Author)

AD-296 278 Div. 16
(TISTB/DGH) OTS price $1.10

Army Biological Labs., Frederick, Md.
ON THE PRODUCTION OF CRYSTALLOMORPH CONCRETIONS OF A PROTEIDIC NATURE BY A STRAIN OF PASTEURELLA PESTIS,
by Georges Girard. Jan 63, 3p. (Trans. no. 712)
Unclassified report

Presented at the meeting of the Biology Society, 28 Feb 59.

DESCRIPTORS: *Pasteurella, Crystal structures, Preparation, Amino acids, Detection, Spectroscopy, Proteins, Culture media.

For some twenty years the appearance of whitish concretions interspersed in cultures made on nutrient gelatin from the Girard Robic EV strain of Pasteurella pestis was merely a bacteriological curiosity. The author succeeded in determining the most favorable conditions for producing the concretions for the purpose of study. Desiccation together with aeration are the determining factors in producing the phenomenon on a gelatin medium. An analysis of the crystallized product reveals the identifiable presence of seven amino acids. This fact, together with the results of a spectral analysis, proves the proteidic nature of the concretions. The significance of this phenomenon is still unknown, but further research, now being conducted by the author, will probably throw more light on the problem. (Author)

AD-296 279 Div. 16
(TISTB/DGH) OTS price $1.10

Army Biological Labs., Frederick, Md.
MICROSCOPIC OBSERVATION OF THE CRYSTALLINE PRODUCTS DERIVED FROM THE EV (GIRARD AND ROBIC) STRAIN OF PASTEURELLA PESTIS,
by P. Manigault. Jan 63, 2p. incl. illus. (Trans. no. 713)
Unclassified report

Presented at the meeting of the Biology Society, 28 Feb 59.

DESCRIPTORS: *Pasteurella, Microscopy, Fluorescence, Polarization, Crystal growth, Detection, Culture media.

Examination was made of crystalline formations derived from the Girard-Robic EV strain of Pasteurella pestis, under polarized light and under fluorescent light. Under polarized light, with a red sensitive class I filter, they have a color ranging from yellowish white to straw yellow. Under fluorescent light, they emit an intense greenish yellow radiation. Under the microscope, in polarized light, these preparations most frequently display elements having the appearance of bundles of slender, rectilinear needles. (Author)

AD-296 291 Div. 16
(TISTB/MS) OTS price $1.10

Cologne U. (Germany).
INVESTIGATIONS ON THE PROBLEM OF FORMATION AND PATHOPHYSIOLOGICAL SIGNIFICANCE OF BIOGENIC AMINES IN SUBLETHAL RADIATION INJURIES.
Final technical rept., 1 Nov 61-31 Oct 62, by Fr. Franzen. 31 Oct 62, 7p.
(Contract DA 91-951-EUC-1978)
Unclassified report

DESCRIPTORS: *Metabolism, *Radiation injuries, Urine, Blood, Biochemistry, Excretion, Pathology.

As a result of 2736 determinations of 7 biogenic amines in urine and blood of rats by means of fluorescence spectrofotometry it has been found, that a single short time total body irradiation of 400, 600 and 800 r leads, according to the dose, to a partly considerable increase of tryptamine, 5-hydroxytryptamine, bufotenine, histamine, 3-hydroxytyramine, noradrenaline and adrenaline. The overexcretion of these amines, which was followed up for 21 and 8 days respectively was to be demonstrated from the first day after irradiation. Further 736 fluorescence spectrofotometric determinations of amines, carried out in hourly intervals after total body irradiation of the experimental animals showed, that for 5-hydroxytryptamine, histamine, noradrenaline and adrenaline an overexcretion starting from the fourth hour after radiation treatment is to be demonstrated. By means of further 6928 fluorescence spectrofotometric amine determinations we could show that the measured overexcretion of the above named 7 amines is to be reduced vastly or prevented completely by application of certain inhibitors (phenylacetic acid, alpha-methyldopa); in opposition to other substance tried for radiation protection the named inhibitors have been applied post radiationem. (Author)

AD-296 303 Div. 16
(TISTB/MS) OTS price $1.10

Michigan U., Ann Arbor
ISOLATION, IDENTIFICATION AND PHYSIOLOGY OF A POSTULATED HORMONE CAPABLE OF INDUCING EXCRETION OF SODIUM.
Annual progress rept., 1 Mar 62-28 Feb 63, by J. W. Coan. 13 Feb 63, 5p. illus.
(Grant DA-MD-49-193-62-G62)
Unclassified report

DESCRIPTORS: *Hormones, *Sodium, *Corticosteroid agents, Metabolism disorders, Metabolism, Physiology, Identification, Excretion, Injection (Medicine).

Normal young men (before and after administration of aldosterone) and patients with aldosteronomas were studied using a standardized saline infusion test. Tests were done after standard dietary preparation with both high and low salt diets. Before infusion tests, measurement of plasma volume, extracellular fluid volume, total exchangeable sodium and total exchangeable potassium were done simultaneously by means of a technique developed in this laboratory. Endogenous creatinine clearance, PAH clearance and rates of excretion of sodium, potassium and chloride were measured. During infusion the mean maximum rate of sodium excretion in normals was 0.72 mEq/min (180 mEq Na diet prep.) and 0.14 mEq/min (8-10 mEq Na diet prep.). Twenty-four hours after aldosterone administration (1.0 mg IM q 8 hr) the rate was 0.36 mEq min on the high sodium prep. Seven days after starting aldosterone, with no further change in extracellular fluid volume or GFR, renal escape had occurred and the rate had increased to 1.53 mEq/min without elevation of blood pressure. This value is similar to that found in patients with aldosteronomas (1.63 mEq/min). The results suggest that renal escape from sodium retention is not dependent upon changes in GFR, ECF or blood pressure and that a renal sodium-losing mechanism was activated secondary to aldosterone administration. (Author)

AD-296 334 Div. 16
(TISTB/CCH) OTS price $1.10

Andean Inst. of Biology (Peru).
PYRIDINE NUCLEOTIDE OXIDASES AND TRANSHYDROGENASE IN ACCLIMATIZATION TO HIGH ALTITUDE, by Baltazar Reynafarje. Nov 62, 6p. incl. illus. tables, 7 refs.
(Contract AF 41(657)249, Proj. 7758)
(SAM TDR 62-88) Unclassified report

DESCRIPTORS: *Enzymes, *High altitude, *Adaptation (Physiology), Nucleotides, Tissue (Biology), Heart, Muscles, Nitrogen, Laboratory animals, Liver, Cytochrome oxidase, Biochemistry, Physiology.

Activity of pyridine nucleotide oxidases and transhydrogenase has been examined in heart, liver, and rectus femoris muscle of guinea pigs native of sea level and high altitude. There was an enhanced, reduced form of diphosphopyridine nucleotide oxidase (DPNH-oxidase) and transhydrogenase activity in heart and muscle from animals adapted to high altitude. The higher activity in muscle at altitude was due solely to increase in ratio of red to white portions. Both groups showed the pigmented portion twice as active as the white one. In liver, neither the DPNH-oxidase system nor the transhydrogenase was significantly changed in their activity on a fresh-weight basis. Nevertheless, the DPNH-oxidase is higher at altitude when the activity is expressed per gram of nitrogen. The reduced form of triphosphopyridine nucleotide oxidase activity was not appreciably changed in any of the tissues. It was concluded that adaptation to high altitude is associated with apparent changes in the magnitude of the electron transport pathway. Increased activity in skeletal muscle is probably related to the tissue pigment content. (Author)

AD-296 335 Div. 16
(TISTB/MS) OTS price $1.10

School of Aerospace Medicine, Brooks Air Force Base, Tex.
STRESS RESPONSES OF PILOTS FLYING 6-HOUR OVER-WATER MISSIONS IN F-100 AND F-104 AIRCRAFT, by Vance H. Marchbanks, Henry B. Hale and James P. Ellis Jr. Aug 62, 6p. incl. illus. tables, 13 refs. (Rept. no. SAM TDR 62-112)
(AF Proj. 7759)
Unclassified report

DESCRIPTORS: *Stress (Physiology), *Pilots, Metabolism, Metabolism disorders, Biochemistry, Jet fighters, Epinephrine, Levarterenol, Hematology, Urine, Corticosteroid agents, Flight.

From postflight urine and blood samples, stress was appraised in two groups of pilots flying overwater missions of 6 hours' duration in F-100 or F-104 aircraft. Control determinations were made on a third group of pilots on an off-duty day. Urinary determinations included epinephrine, norepinephrine, corticosteroids (17-OHCS), sodium, potassium inorganic phosphate, urea, uric acid, and creatinine. Blood determinations

included free and conjugated hydrocortisone and corticosterone-like fractions. Flying raised corticosteroid levels in plasma but not in urine. Levels for the F-100 group were higher than for the F-104. Urinary epinephrine and norepinephrine values for the flying groups were significantly above those for the control, values for the F-104 group exceeding those for the F-100. Differences in flying groups appear to relate to aircraft characteristics, weather conditions, and flying experience. Both flying groups showed high urinary excretion of urea and uric acid, but only in the F-104 group was sodium and potassium excretion elevated. Flying induced no variation in urinary phosphate. Singly and collectively, these determinations are basic to future studies on flight stress. (Author)

AD-296 336 Div. 16
(TISTB/MD) OTS price $1.10

Harvard U. Medical School, Boston, Mass.
THE NUMBER OF CATECHOLAMINE STORAGE GRANULES IN ADRENAL MEDULLA,
by W. R. Burack, E. Avery and others. Nov 62, 6p. 13 refs.
(Contract AF 41(657)414, Proj. 7756)
(SAM TDR 62-119) Unclassified report

DESCRIPTORS: *Adrenal medulla hormones, Chickens, Epinephrine, Levarterenol, Cytochemistry, Physiology, Adrenal glands, Cells (Biology), Quantitative analysis, Chromatographic analysis, Storage.

A method is described for counting the catecholamine-containing heavy granules of adrenal glands. There are 5.0 ± 0.8 (S. E.) x 10 to the 12th power granules/gram wet weight of fowl adrenal gland. Individual heavy granules contain about 8 million molecules of catecholamines (1.4 x 10 to the 17th power mole). Reference to published electron microphotographs of adrenal medulla cells allows estimation of the average volume of heavy granules and calculation of the intragranular concentration of catecholamines. The latter probably exceeds 0.5 M. Therefore, unless catecholamines are chemically bound to some polyvalent constituent within the heavy granules, their osmotic activity would be expected to be greater than is consistent with the maintenance of granule integrity. (Author)

AD-296 337 Div. 16
(TISTB/MS) OTS price $1.10

School of Aerospace Medicine, Brooks Air Force Base, Tex.
HEARING OF AIR FORCE PILOTS: 1955 TO 1962,
by Lois L. Elliott. Dec 62, 8p. incl. illus. tables, 9 refs. (Rept. no. SAM TDR 62-127)
Unclassified report

DESCRIPTORS: *Hearing, Aviation medicine, Air Force, Pilots.

The hearing levels of all Air Force pilots examined at the School of Aerospace Medicine from 1955 through mid-April 1962 are surveyed. Pilots are found to have generally superior hearing when compared by age groups with hearing levels of two comparison groups. (Author)

AD-296 338 Div. 16
(TISTB/MS) OTS price $1.10

School of Aerospace Medicine, Brooks Air Force Base, Tex.
COLD PRESSOR TEST - A 20-YEAR FOLLOWUP STUDY OF 123 SUBJECTS,
by Margaret F. Allen and David E. Langdon. Dec 62, 7p. incl. tables, 9 refs. (Rept. no. SAM TDR 62-137)
Unclassified report

DESCRIPTORS: *Blood pressure, *Hypertension, Tests, Statistical analysis, Aging (Physiology), Physiology.

In 1960 blood pressures were obtained on 106 active and retired military subjects on whom the cold pressor test had been performed in 1940. These blood pressures and the cold pressor index (rise in systolic blood pressure, millimeters of mercury) were analyzed for predictability of future hypertension from the index. The mean index of the 11 who became hypertensive was significantly larger than the mean index of the 51, of comparable age, 35 years and older, who remained normotensive. Statistical association was found between hyperreaction (using a cutting point of 10 mm. Hg) and hypertension; however, the accuracy of prediction is not good. Thus the test as defined is not recommended as a predictor of future hypertension. An average increase in diastolic blood pressure of about 7 mm. Hg every 20 years was observed cross-sectionally in 1940 and longitudinally. (Author)

AD-296 339 Div. 16
(TISTB/MD) OTS price $1.10

School of Aerospace Medicine, Brooks Air Force Base, Tex.
A STUDY OF PHOTOSTRESS AND FLASH BLINDNESS,
by Sanford L. Severin, Norris L. Newton, and James F. Culver. Dec 62, 8p. incl. illus. tables, 4 refs. (Rept. no. SAM TDR 62-144)
Unclassified report

DESCRIPTORS: *Vision, Man, Eye, Blindness, Light, Nuclear explosions, Intensity, Threshold (Physiology), Drugs, Sympathomimetic drugs, Parasympathomimetic agents, Physiology, Pharmacology, Adaptation (Physiology).

An experiment was designed to study the effects of pupillary size, flash intensity, testing patch luminance, and subject variability following photostress testing with intense light flashes. Fifteen subjects were exposed to illuminations ranging from 86,080 lux to 242,100 lux as measured at the corneal plane. Recovery was measured as the period of time required after dazzle to regain sufficient visual function to perceive a threshold discriminatory task. The experimental results are discussed and the operational significance is implied.

AD-296 340 Div. 16
(TISTB/DGH) OTS price $7.60

Lovelace Foundation for Medical Education and Research, Albuquerque, N. Mex.
THE ENVIRONMENTAL MEDICAL ASPECTS OF NUCLEAR BLAST.
Technical progress rept.,
by Clayton S. White, I. Gerald Bowen, and Donald R. Richmond. Nov 62, 54p. incl. illus. tables, 53 refs.
(Contract DA 49-146-XZ-055)
(DASA 1341) Unclassified report

Presented before the Twentieth Anniversary Meeting and National Preparedness Symposium Sponsored by the National Institute for Disaster Mobilization, Inc., 13 Nov 1962, Washington, D. C.

DESCRIPTORS: *Nuclear explosions, *Explosion effects, Medicine, Therapy, Radiation effects, Nuclear explosion damage, Wounds and Injuries, Radiation injuries, Radiation hazards, Hazards, Air burst, Symposia, Blast, Medical research.

The nature of certain critical lesions seen after exposure to air blast was described and the early lethality characterizing primary and tertiary blast damage was emphasized along with the seriousness of injuries caused by blast-energized debris. Tentative criteria were developed to the end that different levels of environmental variations caused by blast phenomena could be quantitatively related to various levels of biological response. Using the ''free-field'' scaling laws and a mathematical model whereby translational velocities could be computed for animate and inanimate objects, the criteria were applied to nuclear explosions ranging in yield from 1 kt to 100 Mt. Thus, it was possible to specify, as a function of yield, the hazard ranges inside which various blast injuries might occur. At these ranges the associated levels of initial nuclear and thermal radiation were computed to allow at least some assessment of the relative importance of all the major hazards from nuclear detonations. (Author)

AD-296 342 Div. 16
(TISTB/MD) OTS price $1.10

Emory U., Ga.
ELECTRICAL AND ELECTROCHEMICAL PROPERTIES OF MUSCLE CELLS SUBJECTED TO VARIOUS DOSES OF X-RADIATION.
1963, 4p.
(Contract DA 49-193-md-2256)
Unclassified report

DESCRIPTORS: *Radiation effects, *Muscles, Amphibians, Contraction, Biophysics, Radiobiology, X-rays, Biochemistry, Electrolytes (Physiology), Phosphorylation, Oxidation, Microsomes, Electrical properties, Electric potential, Physiology, Glycolysis, Cesium compounds, Membranes (Biology).

AD-296 343 Div. 16
(TISTB/JB) OTS price $12.00

Lockheed Aircraft Corp., Sunnyvale, Calif.
SPACE TRAVEL AND HUMAN THERMAL LIMITS: A SELECTED BIBLIOGRAPHY.
Addendum to the Space Materials Handbook, comp. by Robert C. Gex. Feb 62, 163p. 424 refs.
(Special bibliography no. SB-61-33; Rept. no. 3-34-61-3)
(Contract AF 04(647)673)
Unclassified report

DESCRIPTORS: *Thermal radiation, *Heat tolerance, *Hypothermia, *Bibliographies, Hypoxia, Hibernation, Body temperature, Physiology, Control, Shivering, Clothing, Pressure suits, Exposure, Acceleration tolerance, Space environmental conditions.

AD-296 447 Div. 16
(TISTB/MD) OTS price $1.60

Emory U., Ga.
ION EFFECTS IN X-RAY DEPOLARIZATION OF MUSCLE MEMBRANE.
by Adolfo Portela, Juan C. Perez and others.
1962, 8p. illus. table, 4 refs.
(Contract DA 49-193-md-2256)
Unclassified report

DESCRIPTORS: *Muscles, *Radiation effects, *Radiobiology, Membranes (Biology), Electrical potential, Amphibians, Sodium compounds, Potassium compounds, Electrolytes (Physiology), Calcium compounds, Cells (Biology), Ions, Physiology, X-rays.

Irradiation of frog sartorius muscles with 100 Kr of X-rays results in a relative decrease in resting membrane potential which is dependent on external sodium concentration, but not on potassium concentration provided that the latter exceeds 1.0 mM. In zero potassium solutions, the potential decreases more, and continues to fall after irradiation. Neither irradiation nor stimulation alters the rate at which Ca^{45} is lost from previously loaded muscle fibers. Apparently irradiation damage to the muscle cell membrane results in increased permeability to sodium, but not via the release of calcium ions. Sodium extrusion mechanisms are altered by irradiation so as to require an external potassium concentration above 1.0mM to match the increase of Na influx. Permeability to potassium does not appear to be altered by irradiation. (Author)

AD-296 448 Div. 16
(TISTB/MD) OTS price $1.60

Emory U., Ga.
CESIUM-SODIUM INTERACTIONS ON X-RAY DEPOLARIZATION OF MUSCLE FIBERS,
by Adolfo Portela, Juan C. Perez and others.
1962, 6p. illus. tables, 3 refs.
(Contract DA 49-193-md-2256)
Unclassified report

DESCRIPTORS: *Muscles, *Radiation effects, *Cesium compounds, *Radiobiology, Membranes (Biology), Amphibians, Sodium compounds, Potassium compounds, Electrolytes (Physiology), Cells (Biology), Physiology, Ions, Electric potential, X-rays.

Cesium ions in bathing fluid produce a depolarization of frog sartorius muscle fibers independent of the depolarization produced by irradiation. The fractional depolarization produced by x-rays is independent of external cesium concentration, but proportional to external sodium concentration, and is explained as the result of an increased sodium ion permeability. Cesium depolarization (20mMCs) in non-irradiated fibers increases with decreasing sodium concentration, indicating a specific sodium-cesium interaction in the membrane. A simple concentration-cell potential explanation for the cesium effects is not yet adequate. (Author)

AD-296 449 Div. 16
(TISTB/MD) OTS price $4.60

Emory U., Ga.
RADIATION DAMAGE IN MUSCLE CELL MEMBRANES AND REGULATION OF CELL METABOLISM,
by Adolfo Portela, Juan Carlos Perez and others.
1962, 1v. incl. illus. tables, 17 refs.
(Contract DA 49-193-md-2256)
Unclassified report

DESCRIPTORS: *Radiation effects, *Muscles, *Metabolism, *Radiobiology, Membranes (Biology), Amphibians, Biochemistry, Physiology, Microsomes, Cells (Biology), Electrolytes (Physiology), Energy, Adenosine phosphates, Sodium compounds, Potassium compounds, Enzymes, Relaxation (Physiology), Ions, X rays.

Effects of 100,000r doses on striated frog muscles include prolonged relaxation time, more rapid fatigue, and decreased ATP and glycogen content, but increased potassium and sodium

effluxes, sodium influx and oxygen consumption, compared with non-irradiated controls. Twitch latency and rise time are not changed. Magnesium-activated ATPase activity of homogenates or mitochondrial suspensions decreases immediately after irradiation, but increases with time more rapidly than in controls. Biochemical findings suggest uncoupling of oxidative phosphorylation; ion flux data suggest increased membrane permeability. This leads to the hypothesis that irradiation results in sarcoplasma membrane damage, thereby increasing ion permeabilities, and mitochondrial structure damage, thereby interfering with oxidative phosphorylation and reducing ATP production. A 90% decrease in membrane potential during irradiation has already been reported. The observed increases in Na and K fluxes after irradiation explain these findings. At these radiation levels, our data do not require any hypothesis of early direct damage to the contractile mechanism per se. (Author)

AD-296 477 Div. 16
(TISTB/MD) OTS price $3.60

Kitasato Inst. (Japan).
STUDIES OF THE MODE OF ACTION OF ANTIBACTERIAL DRUGS.
Rept. no. 3 (Final), 1 Nov 61-31 Oct 62,
by Yoskiyuki Yajima and Toru Hayakawa.
31 Oct 62, 22p. illus. tables, refs.
(Contract DA 92-557-FEC-35673)
Unclassified report

DESCRIPTORS: *Antibiotics, *Nitrogen heterocyclics, *Chemotherapeutic agents, Chloramphenicol, Staphylococcus, Biochemistry, Biosynthesis, Labeled substances, Carbon, Inhibition, Synthesis, Glycoside hydrolases, Proteins, Nucleic acids, Purines, Amino acids, Streptomyces, Chemotherapeutic agents, Antitubercular agents, Mice, Toxicity, Isoniazid, Cobalt compounds, Iron compounds, Mycobacterium tuberculosis, Bacillus anthracis, Bacillus subtilis, Shigella, Salmonella, Escherichia, Pseudomonas, Pharmacology.

The effects of mitomycin and carzinophilin on the incorporation of radioactive glycine and adenine and on the induction of beta-galactosidase in Staph. aureus were studied to determine whether or not they act through interference with nucleic acid or protein synthesis. Preparation of C14-labeled leucomycin was attempted. The antibacterial activity and toxicity of hydroxyquinoline derivatives and antagonism by EDTA and cobalt were determined. Some causal relationship may exist between chelate formation and antibacterial activity of the hydroxyquinolines. (Author)

AD-296 478 Div. 16
(TISTB/CCH) OTS price $2.60

Kitasato Inst. (Japan).
EXPLORATION OF NEW CHEMOTHERAPEUTICS FOR INFECTIOUS DISEASES.
Rept. no. 3 (Final), 1 Nov 61-31 Oct 62,
by Toju Hata and Hiroshi Yamamoto. 31 Oct 62,
25p. incl. illus. tables, 5 refs.
(Contract DA 92-557-FEC-35675)
Unclassified report

DESCRIPTORS: *Antibiotics, *Organic compounds, Protozoa, Yeasts, Purification, Degradation, Viruses, Chemotherapeutic agents, Pharmacology.

Protomycin is a new antibiotic belonging to cycloheximide group with activities against Endameba hystolytica and saccharomyces, particularly resembling to streptimidone by Frohardt et. al. in Parke Davis Company. Degradation products of protomycin were compared with corresponding ones simultaneously obtained from streptimidone. A structure for protomycin was proposed on the basis of the products in referring to the established structure of streptimidones. Purification of cephalomycin was carried out with isoelectric precipitation and chromatography on Sephadex and DEAE cellulose. The unitary activity increased twice. The amino acid constitution (glycine, serine, glutamic and aspartic acids, threonine, proline, alanine, methionine, leucine, valine, phenylalanine, histidine, cystine, tyrosine and lysine) and N-terminal amino acid (aspartic or glutamic acid) were determined. (Author)

AD-296 479 Div. 16
(TISTB/CCH) OTS price $2.60

Keio U. School of Medicine, Tokyo (Japan).
HISTOCHEMICAL STUDIES ON THE DISTRIBUTION OF ENZYMES, ESPECIALLY OXIDASES AND PHOSPHATASES IN THE LIVING BODY.
Rept. no. 1 (Final), 15 Oct 61-14 Oct 62,
by Tadao Mitsui. 14 Oct 62, 22p. tables.
(Contract DA 92-557-FEC-35609)
Unclassified report

DESCRIPTORS: *Histology, *Enzymes, Oxidoreductases, Phosphoric monoester hydrolases, Blood cells, Eye, Nerve cells, Animals, Laboratory animals, Peroxidase, Cytochemistry, Biological stains, Biochemistry, Biosynthesis.

Comparative study of cytochemical reactions in the blood cells, cornea and the neuroglia was made on 44 different vertebrates. Among the vertebrates examined, the peroxidase in the leukocytes was evenly distributed, while the phosphatase in the leukocytes was found sporadically. The strongest reaction of peroxidase in leukocytes was found in man, while that of alkaline phosphatase in leukocyte was in lower animals such as guinea pigs and salamanders. The alkaline phosphatase reaction occurred very intensely in the stratified epithelium of the cornea, while did not occur at all in the stroma which contains many lymph capillaries. The finding of this cytochemical reaction of the cornea was nearly the same in the animals examined. The cytochemical reactions in astrocytes, oligodendroglia and microglia in tissue cultures did not show any cytochemical specific natures respectively. The difference in the cytochemical reactions could not be found at all among animal species. (Author)

AD-296 480 Div. 16
(TISTB/CCH) OTS price $2.60

Sasaki Foundation Medical Institution, Kanda (Japan).
HETEROGENEITY OF CANCER CELL POPULATION WITH REGARD TO THE NATURAL DRUG RESISTANCE OF CANCER CELL.
Final rept., 1 Jan-31 Dec 62,
by Tomizo Yoshida. 31 Dec 63, 20p. incl. illus. tables, 5 refs.
(Contract DA 92-557-fec-35765)
Unclassified report

DESCRIPTORS: *Cancer, *Medical research, Drugs.

The actual state of drug resistance of tumor cell population is a matter of ''grading'' when it is considered on the cellular level. Every tumor has its own peculiar grade of ''natural'' drug resistance and the grade is not a fixed value but it can fluctuate naturally around a

certain level within a limited range of variations corresponding to the resistance of its cell population. Population analysis of a neoplastic population, after establishing single cell clones from the population, has so far demonstrated that the tumor cell population is not of a homogeneous constitution but is a heterogeneous complex of cells of fluctuated grades of drug resistance. The resistance of a tumor cell population, therefore, is the averaged sum of all that of its constituents which differ from each other in their grade of resistance. (Author)

AD-296 538 Div. 16
(TISTB/DGH) OTS price $1.60

Kent State U., Ohio.
THE EFFECT OF VIOLENT EXERCISE ON TISSUE GLYCOGEN IN ALBINO MICE,
by Charles G. Wilber. 1963, 10p. table, 6 refs. (Contract DA 49-193-md-2216; In cooperation with The Armed Forces Institute of Pathology, Washington, D. C.)

Unclassified report

DESCRIPTORS: *Exercise, *Metabolism, Swimming, Fatigue, Mice, Muscles, Liver, Chemical analysis, Histological techniques, Effectiveness, Glycogen.

Albino mice were forced to swim to exhaustion in water baths of different temperatures. Histochemical and microchemical analyses of various tissues from exercised and control mice were made. There was found a positive correlation between the following: Bath temperature and swimming time; liver glycogen and body weight; muscle and liver glycogen. Negative correlations were found between liver glycogen and bath temperature; liver glycogen and swimming time. Muscle glycogen is held relatively constant after the first twenty minutes of swimming. (Author)

AD-296 542 Div. 16
(TISTB/CCH) OTS price $1.10

School of Aerospace Medicine, Brooks Air Force Base, Tex.
PAROTID FLUID AND SERUM GLUCOSE LEVELS AND PAROTID FLUID FLOW RATE AS RELATED TO DENTAL CARIES STATUS,
by Ira L. Shannon, William A. Gibson and others. Jan 63, 5p. incl. illus. table, 17 refs. (Rept. SAM TDR 62-140)

Unclassified report

DESCRIPTORS: *Teeth, *Blood, *Salivary glands, Glucose, Diseases, Fluid flow.

Parotid fluid samples were collected without exogenous stimulation from 507 systemically healthy young adult males. Blood was drawn from each participant and subjects were classified as to dental caries experience (DMFS). Parotid fluid flow rate was recorded, and serum and parotid fluid were analyzed for glucose concentration by the glucose oxidase procedure. The presence of glucose in parotid fluid was confirmed. Neither parotid fluid flow rate, parotid fluid glucose level, nor serum glucose concentration was found to be related to caries experience. For all participants, the mean for each of the three variables was 0.042 (S.D. ± 0.036) ml./min., 0.75 (S.D. ± 0.68) mg. %, and 84.8 (S.D. ± 7.76) mg. %, respectively. (Author)

AD-296 556 Div. 16
(TISTB/MD) OTS price $1.60

School of Aerospace Medicine, Brooks Air Force Base, Tex.
PROTECTION AGAINST IONIZING RADIATION: X-IRRADIATED MONKEYS RECEIVING PREIRRADIATION PROPHYLAXIS AND POSTIRRADIATION THERAPY,
by George S. Melville, Jr., George W. Harrison and others. Dec 62, 10p. incl. illus. tables, 9 refs. (Rept. no. SAM TDR 62-103)
(Proj. 7757)

Unclassified report

DESCRIPTORS: *Radioprotective agents, *Organic compounds, Hemorrhage, Reticuloendothelial system, Barbiturates, Primates, Amino acids, Survival, Dosage, Pathology, X-rays, Radiation effects, Therapy, Blood transfusions, Antibiotics, Bone marrow, Lymphatic system, Edema, Chlortetracycline, Gamma globulin, Penicillins, Tetracylines, Chemotherapeutic agents, Parenteral infusions, Effectiveness, Pharmacology.

In this study, postirradiation symptomatic therapy of the radiation syndrome has been utilized to provide significant extension of survival time, compared to irradiated controls, of monkeys x-irradiated to a total dose of 900 r. Further, the therapeutic regimen has been successfully combined with chemical radioprotectants to enhance survival time in a third group of animals. This combined treatment is more effective than the therapy alone. The overall clinical condition of these animals is far superior to that of the untreated irradiated animals. Pathologic studies of the deceased animals indicate that the two major causes of death were bone marrow failure and severe lymphoid atrophy. The protective chemical treatment is in itself a combination of different mechanisms of radioprotection, routes of administration, and sites and rates of absorption of the drugs. (Author)

AD-296 557 Div. 16
(TISTB/MD) OTS price $1.10

School of Aerospace Medicine, Brooks Air Force Base, Tex.
IN VITRO PERFORMANCE OF STANNOUS FLUORIDE PROPHYLAXIS PASTE AND TOPICAL SOLUTION-ALONE AND IN COMBINATION,
by Ira L. Shannon and William A. Gibson. Nov 62, 5p. incl. table, 8 refs. (Rept. no. SAM TDR 62-126)
(Proj. 7756)

Unclassified report

DESCRIPTORS: *Teeth, *Dentistry, Tin compounds, Fluorides, Man, Toilet articles, Solutions, Solubility, Therapy, Diseases, Medical research.

A comparison was made of the in vitro effectiveness of three methods of stannous fluoride application in reducing enamel solubility of extracted human molars and bicuspids: (1) X-6 prophylaxis paste alone, (2) 10 percent aqueous stannous fluoride topical solution alone, (3) combined X-6 prophylaxis paste and 10 percent aqueous stannous fluoride topical solution. The results obtained with the X-6 prophylaxis paste alone and the 10 percent aqueous stannous fluoride topical solution alone were found not to differ statistically. The treatment combining X-6 prophylaxis paste and 10 percent aqueous stannous fluoride topical treatment was found to be more effective than the X-6 prophylaxis paste when each was prepared with solutions 1, 2, and 4 weeks of age. Combined application was also

more effective than the 10 percent aqueous stannous fluoride topical treatment alone when each was prepared with solutions 1, 2, 8, and 22 weeks of age. Treatment reduced enamel solubility by over 75 percent in all experimental groups and there was no loss of effectiveness when the constituent stannous fluoride solutions were aged over a 22-week period. (Author)

AD-296 581 Div. 16
(TISTB/JB) OTS price $1.60

Naval Radiological Defense Lab., San Francisco, Calif.
MOUSE FETAL LIVER: A SOURCE OF IMMUNOLOGICALLY REACTIVE CELLS,
by M. L. Tyan and L. J. Cole. 3 Jan 63, 12p. incl. table, 16 refs. (Rept. no. NRDL-TR 605)
Unclassified report

DESCRIPTORS: *Immunology, Liver, Lymphatic system, Laboratory animals, Mice, Embryos.

AD-296 586 Div. 16
(TISTB/MD) OTS price $1.60

Rogers Brothers Seed Co., Idaho Falls, Idaho.
STUDY ON COMMERCIAL LIKE STORAGE OF IRRADIATED POTATOES.
Rept. no. 2 (Final), 1 Oct 59-30 Sep 60,
by Miles Willard. 30 Sep 60, 5p. incl. tables.
(Rept. no. S-757-2)
Unclassified report

DESCRIPTORS: *Potatoes, *Preservation, Food, Dehydrated foods, Storage, Colors, Taste, Weight, Carbohydrates, Radiation effects.

The experimental observations made during the storage period indicate that the irradiated potatoes were more resistant to wet rot and sprouting than the non-irradiated potatoes. They appeared however to have far less resistance to discoloration. In other respects no significant differences were observed. (Author)

AD-296 588 Div. 16
(TISTB/MD) OTS price $1.10

Maryland U., College Park.
SPECTRAL SENSITIVITY FOR SMALL RETINAL AREAS.
Annual progress rept., 1 Aug-31 Dec 62,
by John Krauskopf. 10 Feb 63, 7p.
(Contract DA 49-193-md-2327)
Unclassified report

DESCRIPTORS: *Eye, Optical images, Light, Monochromatic light, Optics, Retina, Visual acuity, Ophthalmology, Optical equipment, Distortion, Optical properties.

Measurements of the image forming properties of the eye in white and monochromatic light are discussed. The results show that the eye forms poorer images than an aberration free lens and that its departure from ideal performance increases with pupil size. Since imagery is no better with monochromatic light than with white light, it is concluded that spherical aberration (or more properly irregular variation in dioptric power over the pupil) is probably the main cause of the departure from ideal performance. The results agree with measurements of visual acuity which show that acuity is not significantly altered by the spectral composition of the stimulus. Experiments with annular as opposed to round pupils are briefly discussed. (Author)

AD-296 780 Div. 16
(TISTB/JB) OTS price $1.10

Indiana U., Bloomington.
THE PHYSIOLOGY OF SWEAT GLANDS.
Annual progress rept., 1 July 61-31 Oct 62,
by Sid Robinson. 31 Oct 62, 7p. incl. table.
(Grant no. DA-MEDDH-60-10)
Unclassified report

DESCRIPTORS: *Glands, *Perspiration, Secretion, Physiology.

Time relations were studied of the sweating responses of men during vigorous exercise and recovery with corresponding changes of temperature in the rectum, oesophagus, tympanic membrane, femoral and saphenous veins, gastrocnemius muscle and at 7 points on the skin. The results suggest that sweating was regulated in these exercise experiments by reflex effects originating from thermal receptors in the veins which drain warm blood from the working muscles, summated with reflexes from cutaneous thermal receptors, and with alterations of activity if the hypothalamic center produced directly by temperature changes in the center. Mechanoreceptors in muscles and joints probably do not participate in the regulation of sweating in exercise. d-Aldostrone, administered to normal men by continuous intravenous infusion, was found not to alter the NaCl concentration of their sweat during 5 to 7-hour periods of work in the heat (45 C.). Continuous infusion of d-aldosterone at 0.1 mg/hr into one brachial artery did not alter the Na or Cl concentration of sweat being secreted by the infused forearm. (Author)

AD-296 803 Div. 16
(TISTB/MD) OTS price $2.60

Lockheed Aircraft Corp., Sunnyvale, Calif.
THE RESPONSES OF LIVING ORGANISMS AND ORGANIC MATERIALS TO DEUTERIUM: A SELECTIVE BIBLIOGRAPHY,
comp. by Charlie M. Pierce. Oct 62, 19p.
(Special Research bibliography no. SRB-62-6; Rept. no. 5-10-62-23)
Unclassified report

DESCRIPTORS: *Deuterated compounds, *Bibliographies, *Heavy water, *Biochemistry, Biophysics, Physiology, Viruses, Algae, Bacteria, Fungi, Plants (Botany), Drosophilidae, Exchange reactions, Displacement reactions, Organic compounds, Proteins.

Selected references on the responses of living organisms and their molecular products to deuterium are presented. The general period of coverage dates from 1957 through 1961. The references are grouped by subject and arranged according to the journal in which they appeared. (Author)

AD-296 876 Div. 16
(TISTB/MD) OTS price $1.60

Johns Hopkins U. School of Medicine, Baltimore, Md.
(No title).
Final rept., 1 Oct 46-30 June 62,
by Kenneth L. Zierler. 30 June 62, 16p. 105 refs.
(Contract Nonr-24834, Proj. NR 101-241)
Unclassified report

DESCRIPTORS: *Muscles, *Physiology, *Organic compounds, Pathology, Curare alkaloids, Kidney function tests, Kidneys, Dogs, Man, Urine, Hormones, Rats, Electrolytes (Physiol-

ogy), Potassium compounds, Neuromuscular transmission, Vitamin E, Membranes (Biology), Insulin, Metabolism, Oxygen consumption, Glucagon, Epinephrine, Pituitary hormones, Blood circulation, Glucose, Biochemistry, Pharmacology.

The research supported by an ONR contract during the period 1946-1962 is summarized. The aim of the project was to study metabolic, electrical, and mechanical events in neuromuscular function in man and the experimental animal in order to understand these processes and thereby to gain some insight into mechanisms involved in clinical manifestations of disturbances of these functions. References for 105 reports and reviews in the literature which describe the work in detail are appended. (Author)

AD-296 896 Div. 16
(TISTB/JB) OTS price $3.00

Chance Vought Corp., Dallas, Tex.
INVESTIGATION OF A PERSONNEL RESTRAINT SYSTEM FOR ADVANCED MANNED FLIGHT VEHICLES.
Rept. for May 60-Feb 62 on Aerospace Systems Personnel Protection,
by Howard E. Freeman, William C. Boyce, and C. F. Gell. Dec 62, 144p. incl. illus. tables, 99 refs. (Rept. no. 3-14000/2R28)
(Contract AF 33(600)41418, Proj. 6301)
(AMRL TDR 62-128) Unclassified report

DESCRIPTORS: *Safety devices, *Impact shock, *Life support, *Spacecraft seats, *Acceleration tolerance, Safety harness, Astronauts, Supersonic flight, Acceleration, Deceleration, Manned spacecraft, Aviation safety, Human engineering.

AD-296 941 Div. 16
(TISTB/MD) OTS price $8.60

Uppsala U. (Sweden).
QUANTUM GENETICS AND THE APERIODIC SOLID. SOME ASPECTS ON THE BIOLOGICAL PROBLEMS OF HEREDITY, MUTATIONS, AGEING, AND TUMORS IN VIEW OF THE QUANTUM THEORY OF THE DNA MOLECULE,
by Per-Olov Lowdin. 11 Nov 62, 86p. incl. illus. table, 86 refs. (Technical note no. 85)
(Contract AF 61(052)351)
(ARL 63-28) Unclassified report

DESCRIPTORS: *Genetics, *Desoxyribonucleic acids, *Organic compounds, Biophysics, Chemical bonds, Proteins, Biosynthesis, Amino acids, Helixes, Ribonucleic acids, Mutations, Viruses, Aging (Physiology), Neoplasms, Nucleic acids, Nucleotides, Purines, Molecular structure, Quantum mechanics, Biochemistry.

According to Watson-Crick's stereo model, DNA-molecule is a double helix with two sugar-phosphate chains held together by a sequence of pairs of nucleotide bases (A,G,T,C) joined by hydrogen bonds. Pairing is specific (A-T, G-C) and, in cell duplication, each half of helix is forming its own complement. It is believed that genetic information is contained in sequence of base pairs which is preserved through this arrangement. Possible mechanisms for replication and transcription of genetic message through DNA-duplication and RNA-formation are discussed. According to quantum mechanics, there is a finite probability that normal base pairs A-T and G-C may spontaneously go over into tautomeric pairs A-T and G-C through a proton exchange along hydrogen bonds. Since tautomeric bases have another pairing pattern (A-C, G-T, C-A, T-G), proton exchange leads inevitably to errors in genetic base sequence in next duplication. This mechanism may be responsible for occurrence of spontaneous mutations, ageing (considered as a loss of useful genetic information through accumulation of errors), and occurrence of spontaneous cancer when accumulated errors have passed a critical limit in a certain direction. (Author)

AD-296 950 Div. 16
(TISTB/JB) OTS price $2.25

Boeing Co., Seattle, Wash.
INVESTIGATION OF SELECTED HIGHER PLANTS AS GAS EXCHANGE MECHANISMS FOR CLOSED ECOLOGICAL SYSTEMS.
Final rept., Mar 61-Apr 62,
by A. J. Pilgrim and S. P. Johnson. Sep 62, 82p. incl. illus. tables, 18 refs.
(Contract AF 33(616)7945, Proj. 7164)
(AMRL TDR 62-127) Unclassified report

DESCRIPTORS: *Plants (Botany), *Photosynthesis, Nutrition, Controlled atmospheres, Argon, Helium, Growth, Biochemistry, Closed-cycle ecological systems, Fluorescence.

The growth of a variety of Angiosperms was evaluated under controlled conditions in low intensity fluorescent light. Although a large number of species exhibited various abnormalities, three species, Brassica Chinesis, Chichorium endiva, Amaranthus gangeticus, were able to tolerate and grow normally under the conditions used. Studies of the photosynthetic activity of these plants showed that a great deal of variation is to be expected both under standard conditions of culture and in media containing increased salt concentrations. Studies of photosynthetic activity by the plants in an atmosphere with the nitrogen replaced with argon or helium indicated that these gases had no adverse effects. Analysis of the three plants included estimation of amino acids, carbon, water and alcohol soluble carbohydrates, protein, nitrogen, ash, lipid, and vitamins A, C, and E. The results indicate that the roots, stems, and leaves of these three species could provide a valuable nutritional supplement. Feeding of the plants to rabbits demonstrated that no acutely toxic compounds are present. (Author)

AD-296 951 Div. 16
(TISTB/CCH) OTS price $1.50

Armour Research Foundation, Chicago, Ill.
PHYSICAL AND CHEMICAL CHARACTERISTICS OF CHLOROPLAST FRAGMENTS. APPLIED RESEARCH CONCERNING ARTIFICIAL PHOTOSYNTHESIS.
Final rept., 1 Nov 61-14 Sep 62 on Space Biology Research,
by Jean A. Gross, Milton J. Becker, and Alan M. Shefner. Dec 62, 43p. incl. illus. tables, 36 refs. (Rept. no. ARF 3174-24)
(Contract AF 33(616)7255, Proj. 7164)
(AMRL TDR 62-146) Unclassified report

DESCRIPTORS: *Photosynthesis, *Plants (Botany), *Chlorophylls, Proteins, Biochemistry, Electrophoresis, X-ray diffraction analysis, Space medicine.

Chloroplasts isolated from spinach leaves were physically fragmented and then fractionated by differential centrifugation. A high-activity fraction, designated CF(20-50), was obtained and retained its high activity regardless of environmental changes. It had a low protein content and a relatively high chlorophyll-to-protein ratio. Plastoquinone was present in high concentration. Extraction of plastoquinone from CF(20-50) inhibited Hill activity. Unlike whole

chloroplasts, readdition of plastoquinone failed to induce even partial recovery. The average particle size in CF(20-50) was 1500 angstroms in diameter. The average sedimentation constant was 800; the molecular weight was about 8 x 10 to the 7th power; and it showed three electrophoretic bands. CF(20-50) showed maximal Hill activity, but was not the smallest photo-active unit studied. Although the nature of the smallest functional unit is uncertain, it is clear that a CF(20-50) particle is composed of smaller sub-units probably oriented to impart high activity to the larger composite structure. (Author)

AD-296 952 Div. 16
(TISTB/DGH) OTS price $.75

Airesearch Mfg. Co., Los Angeles, Calif.
SUBCRITICAL LIQUID OXYGEN STORAGE AND CONVERSION SYSTEM FOR OMNIGRAVIC OPERATION.
Final rept. on Equipment for Life Support in Aerospace,
by R. L. Polk. Dec 62, 17p. incl. illus.
(Rept. no. AE-2072-R)
(Contract AF 33(616)7153, Proj. 6373)
(AMRL TDR 62-143) Unclassified report

DESCRIPTORS: *Oxygen, *Closed cycle ecological systems, Storage, Design, Low pressure research, Distribution, Control, Liquids, Controlled atmosphere.

The design and development of a low-pressure storage system for the storage of liquid oxygen, the conversion of the liquid to usable, gaseous state, and the controlled delivery of the gaseous oxygen under omnigravic conditions, are studied. The program was an extension of the feasibility study of a system employing an internal relief valve, and provided for, in particular, the minimization of evaporation loss of stored liquid oxygen through standby venting caused by heat leakage to the stored liquid, and the development of suitable fluid capacity gauging equipment. An account is presented of the design and development of a subcritical liquid oxygen storage and conversion system and outlines the final engineering conclusions and recommendations. (Author)

17. METALLURGY

AD-296 008 Div. 17
(TISTM/ODN) OTS price $4.60

Defense Metals Information Center, Columbus, Ohio.
SELECTED ACCESSIONS,
comp. by Patricia B. Plate. Jan 63, 37p.
(Contract AF 33(616)7747)
Unclassified report

DESCRIPTORS: *Heat-resistant metals and alloys, *Metals, *Refractory materials, *Coatings, *Bibliographies, Composite materials, Cobalt alloys, Nickel alloys, Steel, Stainless steel, Iron alloys, Beryllium, Titanium, Magnesium, Silicon, Abstracts, Carbon, Graphite, Niobium, Molybdenum, Tantalum, Vanadium, Tungsten, Platinum.

Contents:
High-strength alloys- cobalt base, nickel base, engineering steels, stainless steels, iron base
Light metals- beryllium, titanium, magnesium, silicon
Nonmetallics- carbon, graphite, special refractories, ceramic oxide
Refractory metals- columbium, molybdenum, tantalum, vanadium, tungsten, platinum group
Miscellaneous- coatings, applications, composites

AD-296 033 Div. 17, 14, 25
(TISTM/RGR) OTS price $1.60

Watertown Arsenal Labs., Mass.
GEOMETRY OF HIDDEN DEFECTS DETERMINED BY ULTRASONIC PULSE ANALYSIS AND SPECTROSCOPY,
by Otto R. Gericke. Dec 62, 12p. incl. illus.
(Technical rept. no. WAL TR 830.5/5)
(DA Proj. 59925001)
Unclassified report

DESCRIPTORS: *Ultrasonic radiation, *Spectrum analyzers, *Metals, *Non-destructive testing, Theory, Piezoelectric crystals, Aluminum, Quality control, Fracture (Mechanics), Microstructure, Spectroscopy, Materials.

A novel ultrasonic test method is described utilizing ultrasonic signals which contain a broad band of frequencies, and, in analogy to optics, can therefore be considered as white ultrasonic pulses. The form and spectral energy distribution, or color, of such ultrasonic pulses is influenced by the geometry of a defect from which they are reflected. Hence, an analysis of the defect echo yields information on the defect configuration. (Author)

AD-296 040 Div. 17
(TISTM/AM) OTS price $.75

Defense Metals Information Center, Columbus, Ohio.
REPORT ON MEETING TO REVIEW MARAGING STEEL PROJECTS,
by A. M. Hall. 28 Dec 62, 18p. (DMIC memo. no. 162)
(Contract AF 33(616)7747, Proj. 2(8-8975))
Unclassified report

DESCRIPTORS: *Symposia, *Iron alloy, *Martensite, *Steel, Mechanical properties, Additives, Abstracts, Welding, Cold-working, Rocket cases, Effectiveness, Dispersion hardening.

Contents:
Evaluation and fabrication of maraging steels
  Weldability of 18, 20, and 25 per cent nickel maraging steel sheet
  Fabrication of 18 per cent nickel rocket motor cases
  Hydrostatic testing of subscale and full scale units
Mechanical properties of maraging steels
  Preliminary evaluation of mechanical strength and fracture toughness of thick plate maraging steel
  Variations in physical and mechanical properties
  Properties of maraging steel press forgings
  Fracture toughness studies on nickel maraging steels
Maraging steels in rocket motor cases
  High performance rocket motor cases
  Evaluation of high nickel steel for application in large boosters

AD-296 082 Div. 17, 8
(TISTM/AM) OTS price $1.60

Lear Siegler, Inc., Santa Monica, Calif.
SEMICONDUCTOR THIN FILMS.
Quarterly rept. no. 2, 1 Oct-31 Dec 62.
31 Dec 62, 10p. incl. illus. table.
(Contract NObsr-87634)
Unclassified report

DESCRIPTORS: *Semiconducting films, *Gallium compounds, *Arsenic compounds, Hall effect, Vapor plating, Coatings, Semiconductor devices, Semiconductors.

Contents:
Ultra high vacuum deposition
Electrical measurement
High vacuum deposition
Substrates
Plasma torch
Deposition of doped silicon
Device experiments

AD-296 126 Div. 17, 25
(TISTM/BRW) OTS price $1.10

Naval Research Lab., Washington, D. C.
HALL COEFFICIENT OF SUPERCONDUCTING AND NORMAL Nb-25 PERCENT, Zr,
by A. I. Schindler and D. J. Gillespie.
9 Jan 63, 7p. incl. illus. tables, 14 refs.
(NRL rept. no. 5874)
Unclassified report

DESCRIPTORS: *Niobium alloys, Hall effect, Superconductivity, Zirconium alloys, Measurement, Electrical properties.

Hall-coefficient measurements were made on cold-roll Nb-25 percent Zr in the zero-resistance mixed state at 4.2 K and in the normal state at 4.2, 77, and 317 K. With sample current densities from 2000 to 10,000 amp/sq cm in fields of 1 and 9 kilogauss, no Hall voltage for the superconducting sample could be observed with equipment capable of detecting voltages as small as 10 to the -9th power volt. An upper limit of the superconducting Hall coefficient is therefore calculated to be 1 x 10 to the -15th power cu m/amp-sec. The values of the Hall coefficient for Nb-25% Zr in the normal state are found to be 1.14 x 10 to the -10th power cu m, 1.05 x 10 to the -10th power cu m, and 0.84 x 10 to the -10th power cu m/amp-sec at 4.2, 77, and 317 K respectively. (Author)

AD-296 174 Div. 17, 26
(TISTM/BRW) OTS price $2.00

Defense Metals Information Center, Columbus, Ohio.
JOINING OF NICKEL-BASE ALLOYS,

by R. M. Evans. 20 Dec 62, 72p. incl. illus. tables, 60 refs. (DMIC rept. no. 181)
(Contract AF 33(616)7747, Proj. 2(8-8975))
Unclassified report

DESCRIPTORS: *Nickel alloys, Brazing, Resistance welding, Welding, Dispersion hardening, Spot welding, Flash welds, Metal joints, Thermal joining.

The key to the success of many devices that are to be used in corrosive or high-temperature environments is often an ability to properly weld the nickel-base alloys. Alloys such as Monel, Inconel, etc., that do not depend upon relatively complex metallurgical reactions to obtain their desirable properties are not difficult to weld if proper procedures are used. Alloys which are relatively new (Rene 41, Hastelloy R-235, Inconel X, etc.) and do depend on complex metallurgical reactions to develop their useful properties present many joining problems. This report covers, in a general way, the criteria for the successful fabrication of several alloys which fall in each category. Fusion welding, resistance welding, and brazing are covered. The welding of dissimilar nickel-base-alloy combinations and repair welding are also discussed. (Author)

AD-296 192 Div. 17
(TISTM/BRW) OTS price $3.60

Denver Research Inst., Colo.
RESEARCH ON THE SAMARIUM-TYPE INTERMEDIATE PHASES OF INTRA-RARE-EARTH BINARY SYSTEMS.
Technical rept. no. 1, 1 Jan-31 Dec 62, by J. F. Nachman, C. E. Lundin, and G. P. Rauscher, Jr. Jan 63, 32p. incl. illus. tables, 7 refs. (Rept. no. DRI 2080)
(Contract Nonr-336102)
Unclassified report

DESCRIPTORS: *Rare earth elements, Lanthanum, Cerium alloys, Neodymium alloys, Gadolinium alloys, Yttrium, Samarium, Holmium, X-ray diffraction analysis, Hardness, Phase studies.

AD-296 198 Div. 17, 26
(TISTM/ODN) OTS price $5.60

Bell Aerosystems Co., Buffalo, N. Y.
TENSILE AND CREEP PROPERTIES OF COLUMBIUM, TANTALUM, AND TITANIUM ALLOYS AT ELEVATED TEMPERATURES.
by P. E. Moorhead. 10 Dec 62, 51p. incl. illus. table (Rept. no. BLR 62-26(M))
(Contract AF 33(657)8555)
Unclassified report

DESCRIPTORS: *Titanium alloys, *Niobium alloys, *Tantalum alloys, Alloys, Tensile properties, Creep, Heat treatment, High temperature research, Stresses, Elasticity, Deformation, Experimental data, Mechanical properties.

AD-296 199 Div. 17, 26
(TISTM/ODN) OTS price $3.60

Bell Aerosystems Co., Buffalo, N. Y.
SHORT TIME TENSILE AND CREEP PROPERTIES OF COMMERCIALLY PURE TITANIUM AND THREE TITANIUM ALLOYS.
by E. J. King. 7 Dec 62, 26p. incl. illus. tables (Rept. no. BLR 62-24(M))
(Contract AF 33(657)8555)
Unclassified report

DESCRIPTORS: *Alloys, *Titanium alloys, *Titanium, Tensile properties, Creep, Heat treatment, Stresses, Loading (Mechanics), Deformation, Extensometers, Heating, Resistance (Electrical), Elasticity, High-temperature research, Thermocouples, Temperature, Measurement, Mechanical properties.

Data obtained for short time tensile and creep properties of commercially pure titanium (RC70) and three titanium alloys (MST 821, 6Al-4V, and B120VCA at 2500, 2250 and 2000 F are presented. These data indicate that the material possessing the greatest strength at 2500 F is the titanium alloy B120VCA. (Author)

AD-296 222 Div. 17
(TISTM/BRW) OTS price $2.60

Oxford U. (Gt. Brit.).
RESEARCH ON THE FREEZING AND MELTING POINTS OF IRON ALLOYS.
Final technical rept.,
by W. Hume-Rothery. Nov 62, 11p. illus.
(Contract AF 61(514)1062)
(ARL 63-11) Unclassified report

DESCRIPTORS: *Iron alloys, *Carbon alloys, Melting, Freezing, Silver alloys, Palladium alloys, Rhodium alloys, Ruthenium alloys, Technetium, Molybdenum alloys, Niobium alloys, Zirconium alloys, Gallium alloys, Nickel alloys, Phase studies.

AD-296 275 Div. 17, 26
(TISTM/BRW) OTS price $1.10

Aeroprojects, Inc., West Chester, Pa.
INVESTIGATION OF ULTRASONIC WELDING OF REFRACTORY METALS AND ALLOYS.
Bimonthly progress rept. no. 1, 16 Aug-16 Oct 62. Nov 62, 4p. incl. table, 2 refs.
(Contract NOw 63-0125-c)
Unclassified report

DESCRIPTORS: *Heat resistant metals and alloys, *Welding, Control systems, Power equipment, Scheduling, Stainless steel, Nickel alloys, Molybdenum alloys, Titanium alloys, Niobium alloys, Tungsten, Ultrasonic radiation.

Preliminary specifications for Power-Force Programming (PFP) control circuits and the tentative design for a system have been established. PFP components have been secured, and a 4-kilowatt spot welder has been modified to operate with them. Efforts have been expended in securing an adequate source of refractory metals, and probative meetings have been established with manufacturers relative to material composition and processing techniques. (Author)

AD-296 345 Div. 17
(TISTM/AM) OTS price $10.10

Lockheed Aircraft Corp., Sunnyvale, Calif.
BERYLLIUM: A SURVEY OF THE LITERATURE JANUARY - MARCH 1962: AN ANNOTATED BIBLIOGRAPHY,
comp. by Jack B. Goldmann. Oct 62, 123p. 264 refs. (Special bibliography no. SB-62-22; Rept. no. 3-80-62-10)
Unclassified report

DESCRIPTORS: *Beryllium, *Beryllium alloys, *Bibliography, *Manufacturing methods, Processing.

This annotated bibliography covers publications

released during the first quarter of 1962. Citations are arranged alphabetically by author under broad subject headings of Alloys; Analysis; Applications; Compounds; Corrosion; Fabrication Techniques; Joining; Mineralogy; Oxides; Powder Metallurgy and Casting; Processing; Properties; and Miscellaneous. Reference to the use of beryllium in fuels, nuclear reactor applications, effects of radiation, and Cu-Be alloys have been omitted. (Author)

AD-296 350 Div. 17, 26
(TISTM/AM) OTS price $3.60

Lockheed Aircraft Corp., Sunnyvale, Calif.
CHARACTERISTICS OF THE ARC IN TUNGSTEN INERT GAS AND METALLIC INERT GAS WELDING: AN ANNOTATED BIBLIOGRAPHY,
comp. by S. J. Buginas. Oct 62, 32p. 109 refs. (Special bibliography no. SB-62-31; Rept. no. 5-73-62-1)
Unclassified report

DESCRIPTORS: *Welding, *Bibliography, Arc welding, Electric arcs.

The references in this bibliography were selected to assist researchers working with Tig and Mig welding of thick plates. The search was centered around arc characteristics and power sources, although related references were included. Process descriptions were not generally included. A 10-year period, beginning in 1952, was covered. (Author)

AD-296 354 Div. 17, 26
(TISTM/AM) OTS price $3.60

Lockheed Aircraft Corp., Sunnyvale, Calif.
WELDING OF TITANIUM: AN ANNOTATED BIBLIOGRAPHY,
comp. by W. L. Hollister and Charlie M. Pierce. Oct 62, 33p. 76 refs. (Special bibliography no. SB-62-40; Rept. no. 3-80-62-26)
Unclassified report

DESCRIPTORS: *Titanium, *Titanium alloys, *Welding, *Bibliography, Processing.

The scope of this search deals with the area of welding. Information is included on arc welding, brazing, electron beam welding, electroslag welding, diffusion bonding, fusion welding, friction welding, resistance welding, Tig welding, and ultrasonic welding of titanium. The references are arranged alphabetically by author. References which do not list an author are arranged according to the key word in the title. The period of coverage dates from January 1958 through March 1962. (Author)

AD-296 355 Div. 17, 26
(TISTM/AM) OTS price $3.60

Lockheed Aircraft Corp., Sunnyvale, Calif.
WELDING OF NICKEL AND OTHER CONDUCTORS COMMONLY USED IN MODULAR ELECTRONICS ASSEMBLIES: AN ANNOTATED BIBLIOGRAPHY,
comp. by Charlie M. Pierce. Nov 62, 32p. 124 refs. (Special bibliography no. SB-62-41; Rept. no. 3-80-62-27)
Unclassified report

DESCRIPTORS: *Nickel, *Welding, *Bibliography, *Nickel alloys, Electronic equipment, Mechanical properties.

This bibliography provides information on the physical properties and weldability of nickel. References are also included on intimately related topics such as welding techniques and practices, welding equipment, welding standards, and quality control. A section is also included on the application of welding to the fabrication of electronics circuitry. The 124 references which are included have been grouped by subject topics and arranged according to the author. References which do not list authors are arranged according to a key word in the title. The period of coverage dates from 1950 to June 1962. (Author)

AD-296 419 Div. 17, 26
(TISTE/OHD) OTS price $10.50

Metcut Research Associates Inc., Cincinnati, Ohio.
MACHINING OF REFRACTORY MATERIALS.
Technical engineering rept. on Phase 2, 1 Nov 62-31 Jan 63,
by N. Zlatin, M. Field and J. Gould. Feb 63, 126p. incl. illus. tables.
(Contract AF 33(600)42349)
(ASD TR 7-532a, vol. 9)
Unclassified report

DESCRIPTORS: *Refractory materials, *Heat-resistant metals and alloys, Titanium alloys, Chromium alloys, Aluminum alloys, Manganese alloys, Molybdenum alloys, Nickel alloys, Vanadium alloys, Steel, Milling machines, Lathes, Grinders, Drilling machines, Reamers, Taps, Experimental data, Machining.

Tests to determine the feasibility of high speed milling (edge trimming) are in progress. Preliminary test results indicate that high speed milling offers a better than average potential for success in edge trimming 6Al-4V titanium sheet and 15-7 Mo sheet in the 500 to 2500 feet/minute cutting speed range. Drilling tests have been made using the Tornetic drilling unit and a constant speed drill press on D6AC steel in the 54-58 Rc hardness range. Tapping test results on B-120VCA titanium at 400 BHN are presented comparing the Tornetic tapping data with conventional tapping. Machining test data is also presented on B-120VCA titanium, TZM Molybdenum, Mo 0.5 Ti and D-31 Columbium alloy. (Author)

AD-296 536 Div. 17
(TISTM/AM) OTS price $.75

Naval Research Lab., Washington, D. C.
AN INVESTIGATION OF THE EFFECTS OF ALKALINE PHOSPHATE SOLUTIONS AT ELEVATED TEMPERATURES ON COMPOUNDS PREPARED AT ROOM TEMPERATURE,
by A. J. Pollard and A. J. Edwards. 29 Jan 63, 20p. incl. illus. tables, 34 refs. (NRL rept. no. 5865)
Unclassified report

DESCRIPTORS: *Feed water, *High-temperature research, *High-pressure research, *Magnetite, Iron compounds, Calcium compounds, Magnesium compounds, X-ray diffraction analysis, Chemical precipitation, Boilers, Steam power plants, Chlorides, Phosphates, Contamination, Oxidation.

A study was made of the effects of elevated temperatures and pressures exceeding the saturation pressure of water on compounds of some elements known to be present as contaminants on the water side of naval boilers. These compounds were, specifically, the gelatinous precipitates which are produced when sodium phosphate solutions react with solutions of the chlorides of iron, copper, calcium, and magnesium, as well as certain oxides of iron which are the principal components of rust. (Author)

Division 17 - METALLURGY

AD-296 545 Div. 17, 14, 31
(TISTM/EJH) OTS price $2.60

Naval Research Lab., Washington, D. C.
ABYSSAL CORROSION AND ITS MITIGATION. PART II. RESULTS OF A PILOT TEST EXPOSURE,
by B. W. Forgeson, L.J. Waldron and others.
Dec 62, 25p. incl. illus. tables (NRL memo. rept. no. 1383)
(Proj. SR 007-08-11)
Unclassified report

DESCRIPTORS: *Corrosion, *Metals, *Plastics, *Wood, *Corrosion inhibition, Sea water, Underwater, Aluminum alloys, Copper, Titanium, Steel, Stainless steel, Brass, Coatings, Plastic coatings, Antifouling coatings, Zinc, Copper alloys, Nickel alloys, Laminated plastics, Foams, Rubber, Cathodic protection, Degradation.

Results of exposure of various materials at several depths up to 5700 feet in Tongue of the Ocean for a period of approximately 3-1/2 months (111 days) are reported. Low carbon steel suffered much greater general corrosion and pitting when exposed at the surface than it did at 5700 feet; the pattern of corrosion for this material was different at the two locations. All materials included in these tests with the exception of type 5086 aluminum and titanium suffered corrosion of varying degrees, except those cathodically protected or having suitable paint systems. Most of the materials appeared to suffer more extensive crevice corrosion at depth, particularly the type 400 series of stainless steel. Organic coatings appeared to afford excellent protection to steel surfaces submerged to 5700 feet in the ocean for the specified exposure period. The only effect observed on the deep submergence of non-metallic materials was that most of the woods and porous plastics absorbed considerable amounts of water with resultant damage. (Author)

AD-296 759 Div. 17, 26
(TISTM/SJR) OTS price $1.60

Armour Research Foundation, Chicago, Ill.
PILOT EVALUATION OF VANADIUM ALLOYS,
Bimonthly rept. no. 8, 18 Nov 62-17 Jan 63,
by F. C. Holtz. 11 Feb 63, 12p. incl. illus. tables (Rept. no. ARF-B231-8)
(Contract NOw 62-0101-c)
Unclassified report

DESCRIPTORS: *Vanadium alloys, *Processing, *Manufacturing methods, Niobium alloys, Hafnium alloys, Molybdenum alloys, Ruthenium alloys, Tantalum alloys, Tungsten alloys, Zirconium alloys, Metal plates, Extrusion, Sheets, Silicon coatings, Deformation, Fracture (Mechanics), Alloys, Density, Tensile properties.

Experimental vanadium-columbium base alloys were fabricated to sheet from 200-gram arc-melted ingots. The composition V-60w/o Cb-1w/o Zr-0.075w/o C had ultimate tensile strength values of 97,000, 77,000, and 20,000 psi at 1800, 2000, and 2400 F, respectively. On a density-corrected basis, the values up to 2000 F, were the highest of all materials studied under this and the preceding programs. The V-40w/o Cb-30w/o Ta 1w/o Hf alloy had higher 2400 F strength (25,400 psi) but lacked the high room-temperature ductility of the V-Cb-Zr-C material. Extruded and wrought plate, and sheet stock from the second 100-pound ingot (nominal composition V-4w/o Ti-20w/o Cb-1w/o Zr-0.075w/o C) was received and distributed to organizations participating in the data-exchange program. A total of 44 pounds of usable material was obtained, compared to about 30 pounds for the first large ingot. (Author)

AD-296 760 Div. 17, 26
(TISTM/SJR) OTS price $1.60

Armour Research Foundation, Chicago, Ill.
HIGH-TEMPERATURE OXIDATION PROTECTIVE COATINGS FOR VANADIUM-BASE ALLOYS.
Bimonthly rept. no. 2, 13 Nov 62-12 Jan 63,
by J. J. Rausch and F. C. Holtz. 9 Feb 63, 10p. incl. illus. table (Rept. no. ARF-B6001-2)
(Contract N600(19)59182)
Unclassified report

DESCRIPTORS: *Vanadium alloys, *Metal coatings, Tensile properties, Niobium alloys, Titanium alloys, Flame spraying, Nickel alloys, High temperature research, Porosity, Failure (Mechanics), Sheets, Heat resistant materials, Tantalum alloys, Hafnium alloys, Zirconium alloys, Cobalt alloys, Processing, Hardness, Deformation, Stresses, Rupture, Powder metallurgy, Manufacturing methods, Silicon coatings.

Processing variables relating to the pack-siliconizing of V-5w/o Ti-20w/o CB and V-1w/o Ti-60w/o Cb are being studied. Samples coated at 2010, 2190, and 2370 F show that coating growth rate is time dependent up to 16 hours Silicide coatings have been applied to eleven vanadium alloys currently under development, and no failures have been observed after 15 to 35 hours in 2200 F air. Tensile and other specimens of V-1w/o Ti-60w/o Cb have been pack-siliconized for evaluation by aerospace and other organizations. Compounds of V-Cb-Ni were flame-sprayed on V-1w/o Ti 60w/o Cb, but excessive porosity caused rapid failure in 2000 and 2200 F air. Diffusion couples of nickel and the V-Cb-Ti alloy were reacted at 2000 and 2200 F for 24 and 8 hours, respectively, with very slight hardening of the vanadium alloy. (Author)

AD-296 773 Div. 17
(TISTM/AM) OTS price $1.10

Clark U., Worcester, Mass.
TRANSITION METAL COMPLEXES AS POTENTIAL SEMICONDUCTORS,
by A. M. Zwickel and S. Kwan. 11 Feb 63, 7p. 8 refs. (Technical rept. no. 1)
(Contract Nonr-369401, Proj. NR 051-440)
Unclassified report

DESCRIPTORS: *Transition elements, *Complex compounds, *Organic compounds, Resistance, Conductivity, Equations of state, Metalorganic compounds, Semiconductors.

Transition metal complexes present interesting possibilities for the elucidation of the factors influencing the electrical conductivities of solids. This research is directed toward a better understanding of the process of electron transport in solids through studies of electrical properties of a series of related complexes. (Author)

AD-296 856 Div. 17, 15
(TISTP/JW) OTS price $6.60

Brown U., Div. of Applied Mathematics, Providence, R. I.
ON THE ANALYSIS OF THERMAL STRESSES IN VISCO-

ELASTIC SOLIDS,
by Eli Sternberg. Feb 63, 65p. incl. illus. 60 refs. (Technical rept. no. 19)
(Contract Nonr-56225, Proj. NR 064-431)
Unclassified report

DESCRIPTORS: *Solids, *Thermal stresses, Couplings, Linear systems, Stresses, Mechanical properties, Viscoelasticity, Isotropism.

This paper is devoted exclusively to solids that, under isothermal conditions and for infinitesimal strains, exhibit linear viscoelastic behavior. An attempt is made to sketch a systematic account of relevant recent theoretical developments; it is attempted to supply a helpful, if necessarily incomplete, guide to available specific results and to the literature on the subject at hand. The present treatment is largely confined to the quasi-static analysis of thermal stresses in homogeneous and isotropic, linear viscoelastic media. Questions regarding inhomogeneous and anisotropic solids, inertia effects, and thermo-mechanical coupling effects are touched upon. (Author)

AD-296 889 Div. 17, 27
(TISTM/EJH) OTS price $2.60

Aerojet-General Corp., Azusa, Calif.
INVESTIGATION OF STRESS-CORROSION CRACKING OF HIGH-STRENGTH ALLOYS.
Quarterly progress rept. no. 8, 1 Oct-31 Dec 62,
by R. B. Setterlund. Feb 63, 9p. incl. illus. tables (Rept. no. 0414-01-8)
(Contract DA 04-495-ORD-3069)
Unclassified report

DESCRIPTORS: *Corrosion resistant alloys, *Corrosion, *Rocket cases, Steel, Iron alloys, Nickel alloys, Aluminum alloys, Vanadium alloys, Titanium alloys, Stresses, Plastic coatings, Corrosion inhibition, Test equipment, Fracture (Mechanics).

Data to date show that the 6Al-4V titanium alloy is immune to stress-corrosion cracking under the test conditions of this program in both the annealed and in the quenched-and-aged conditions. It was found that stress-corrosion cracking occurs in both 18%- and 20%-nickel maraging steels, after short exposure to specific environments. The 20%-nickel variety, if not cold-worked, is found to crack in a branching intergranular pattern when exposed to distilled water, salt water, or a high-humidity atmosphere. However, when this same alloy is cold-worked before aging, it appears to become immune to cracking in all three of these environments. The 18%-nickel maraging steel has, to date, been tested only in the cold-worked-and-aged condition. In this condition, the alloy cracks in distilled water and in a high-humidity environment; the cracking pattern suggests possible failure along slip planes. (Author)

AD-296 940 Div. 17, 26
(TISTM/ODN) OTS price $3.60

Watertown Arsenal Labs., Mass.
FRACTURE SURFACE CONFIGURATIONS OF AISI 4340 STEEL AS AFFECTED BY TEMPERATURE AND GEOMETRY,
by Frank L. Carr and Frank R. Larson. Jan 63, 28p. incl. illus. tables, 11 refs. (Rept. no. WAL TR 320.1/10)
(Proj. 59332008)
Unclassified report

DESCRIPTORS: *Steel, Fracture (Mechanics), Surface properties, Surfaces, Heat treatment, Configuration, Tensile properties, Tables, Energy, Transition temperature, Rocket cases, Mechanical properties.

Measurements of the different zones of fracture configurations were made on both smooth and notched tensile specimens in addition to Charpy specimens of AISI 4340 steel heat treated to three strength levels and tested over a range of temperatures (-196 to +200 C). These measurements plotted as a function of temperature result in transition curves due to the different modes of fracturing. The differences in both the locus of the origin and direction of propagation of fracture between the smooth and notched tensile specimens are discussed and illustrated. Similarities in the fracture configurations of both tensile and Charpy specimens are also described and illustrated. The importance of these fracture zones and their influence on the notch strength ratio are discussed. (Author)

AD-296 961 Div. 17
(TISTM/AM) OTS price $.75

Physics Lab., Aeronautical Systems Div., Wright-Patterson Air Force Base, Ohio.
X-RAY SPECTROCHEMICAL AND X-RAY DIFFRACTION ANALYSES OF COPPER-PLATINUM ALLOYS.
Final rept., Apr-Sep 62 on Materials Analysis and Evaluation Techniques,
by William L. Baun and John J. Renton. Dec 62, 17p. incl. illus. tables, 10 refs.
(Proj. 7360)
Unclassified report

DESCRIPTORS: *Copper alloys, *Platinium alloys, Tables, Crystal lattices, X-ray diffraction analysis, X-ray spectroscopy.

Results are shown for X-ray spectrochemical analysis and X-ray diffraction analysis of alloys in the copper-platinum alloy system. Lattice parameters are shown for disordered alloys from copper through platinum. Results from X-ray spectrochemical analyses of the alloys are shown and several methods of analysis are discussed. The results show that both zinc and gold are acceptable internal standards for the Cu-Pt alloys and that a coherent scattering internal standard can be used where only a quick approximate answer is required. (Author)

AD-296 987 Div. 17
(TISTM/ODN) OTS price $1.10

Colorado School of Mines, Golden.
IMPROVED OXIDATION RESISTANCE OF MOLYBDENUM BY ALLOYING WITH RARE EARTH AND OTHER SELECTED METALS.
Interim rept. no. 7, 1 Nov-31 Dec 62,
by Wilbur J. Guay. 1 Feb 63, 3p. incl. table.
(Contract NOw 62-0305-d)
Unclassified report

DESCRIPTORS: *Molybdenum alloys, *Hafnium alloys, Oxidation, High temperature research, Diffusion, Oxygen, Antioxidants.

The diffusion rates of hafnium and of oxygen in the alloys during the process of internal oxidation obey the Arrhenius law, as evidenced by straight line plots of log D vs 1/T. This is substantiated by data at three temperatures, 1100, 1200 and 1300 C. (Author)

18. MILITARY SCIENCES AND OPERATIONS

AD-296 073 Div. 18
(TISTB/DGH) OTS price $3.60

Air Force Academy, Colo.
UNCONVENTIONAL WARFARE. PART II. PSYCHOLOGICAL WARFARE.
Dec 62, 37p. refs. (Special Bibliography series no. 22)
Unclassified report

DESCRIPTORS: *Bibliographies, *Psychological warfare, Warfare, Reasoning, Inhibition, Counter insurgency, Propaganda, Tactical warfare, Armed forces operations, Military training, History.

Contents:
Historical and general background
Psychological activities in peacetime or outside combat areas
General combat tactics, operations and training
European War, 1914-1918
World War II, 1939-1945
Korean War, 1950-1953
Brainwashing

AD-296 460 Div. 18
(TISTP/MB) OTS price $3.60

Army Strategy and Tactics Analysis Group, Bethesda, Md.
DEVELOPMENT OF CENTAUR. A COMPUTERIZED WAR GAME. PART I. GENERAL CONSIDERATIONS,
by Charles R. Roberts. Dec 62, 32p. incl. illus. 7 refs. (STAGTEN no. 62121)
Unclassified report

DESCRIPTORS: *Army operations, Armed forces operations, Army research, Game theory, Warfare, Computers, Simulation, Operations research.

This paper describes the basic concepts underlying the development of CENTAUR, an experimental mathematical model for a computerized war game to be used in testing land-combat operational plans at division level. CENTAUR is a two sided, free play, man-computer simulation. The game is played by two opposing forces, Red and Blue, each of which is free to make tactical decisions which are not revealed to the other. (Author)

AD-296 546 Div. 18
(TISTW/RD) OTS price $3.60

Operations Analysis Office, Air Force Logistics Command, Wright-Patterson Air Force Base, Ohio.
WSPACS (WEAPON SYSTEM PROGRAMMING AND CONTROL SYSTEM) MOD ZERO - A DEMONSTRATION MODEL,
by Saul Hoch. Dec 60, 29p. incl. illus. tables. (Operations analysis work paper no. 8)
Unclassified report

DESCRIPTORS: *Weapon systems, Guided missiles, Aircraft, Programming (Computers), Air Force, Management engineering, Costs.

AD-296 548 Div. 18
(TISTW/RD) OTS price $2.60

Operations Analysis Office, Air Force Logistics Command, Wright-Patterson Air Force Base, Ohio.
SOME PRACTICAL COMMENTS ON THE DEVELOPMENT OF ACTIVITY EVENT FLOW NETWORKS,
by James W. Alstrom. Apr 61, 21p. incl. illus. (Operations analysis working paper no. 9)
Unclassified report

DESCRIPTORS: *Logistics, *Management engineering, Statistical analysis, Operations research.

AD-296 549 Div. 18
(TISTW/RD) OTS price $1.60

Operations Analysis Office, Air Force Logistics Command, Wright-Patterson Air Force Base, Ohio.
SOME PRODUCTION ASPECTS AND STOCK LEVEL RESULTS OF THE MATERIEL REPAIR SYSTEM,
by Phillip F. Myers and Irving Katz. Jan 60, 16p. incl. illus. (Suppl. no. 1 to Operations analysis rept. no. 1)
Unclassified report

DESCRIPTORS: *Air force equipment, *Maintenance, *Logistics, Production, Armed forces supplies, Operations research.

AD-296 550 Div. 18
(TISTW/RD) OTS price $4.60

Operations Analysis Office, Air Force Logistics Command, Wright-Patterson Air Force Base, Ohio.
SERVICEABLE ECONOMIC RETENTION LEVELS,
by Irving Katz. May 60, 44p. incl. illus. 9 refs. (Operations analysis technical memo. no. 1)
Unclassified report

DESCRIPTORS: *Logistics, *Air force equipment, Maintenance, Air force procurement, Armed forces supplies, Operations research, Life expectancy.

AD-296 552 Div. 18
(TISTW/RD) OTS price $1.60

Operations Analysis Office, Air Force Logistics Command, Wright-Patterson Air Force Base, Ohio.
THE IMPACT OF FACTORS ON GROSS REQUIREMENTS,
by Irving Katz. Oct 60, 14p. (Operations analysis working paper no. 7)
Unclassified report

DESCRIPTORS: *Logistics, *Air force equipment, Air force procurement, Operations research, Life expectancy.

AD-296 553 Div. 18
(TISTW/RD) OTS price $3.60

Operations Analysis Office, Air Force Logistics Command, Wright-Patterson Air Force Base, Ohio.
MACHINE SELECTION STUDY,
by James R. Gillespie and Kent R. Kiehl. Jan 60, 31p. 3 refs. (Operations analysis working paper no. 4)
Unclassified report

DESCRIPTORS: *Machines, *Logistics, Statistical analysis, Probability, Selection, Reliability, Maintenance, Life expectancy, Air force equipment.

AD-296 828 Div. 18
(TISTB/DGH) OTS price $12.50

Stanford Research Inst., Menlo Park, Calif.
DEVELOPMENT OF A SHELTER ALLOCATION AND USE PLAN

FOR BOSTON,
by Leland H. Towle and John G. Gregory. Jan 63, 157p. incl. illus. tables, refs.
(Contract OCD-OS-62-135)
Unclassified report

Original contains color plates; all ASTIA reproductions will be in black and white. Original may be seen in ASTIA Hq.

DESCRIPTORS: *Civil defense systems, *Shelters, Data, Analysis, Mobilization, Logistics, Radiological dosage, Costs, Warning systems, Radioactive fallout.

AD-296 924 Div. 18
(TISTB/DGH) OTS price $11.00

RAND Corp., Santa Monica, Calif.
PROCEEDINGS OF RAND'S DEMAND PREDICTION CONFERENCE JANUARY 25-26, 1962,
ed. by Max Astrachan and Albert S. Cahn. Jan 63, 135p. incl. illus. tables, refs. (Memo. no. RM-3358-PR)
(Contract AF 49(638)700, Proj. RAND)
Unclassified report

DESCRIPTORS: *Material control, *Strategic materials, *Symposia, Procurement, Transportation, Mobilization, Mathematical prediction, Linear programming, Statistical functions, Distribution, Logistics, Maintenance, Probability.

19. NAVIGATION

AD-296 314 Div. 19, 2, 32
(TISTP/JW) OTS price $8.60

Pacific Missile Range, Point Mugu, Calif.
A STUDY OF NONMILITARY SHIPPING IN THE PACIFIC OCEAN AREA,
by E. Neuron and L. A. Leake. 17 Mar 61, 91p. incl. illus. tables, 58 refs. (Technical memo. no. PMR-TM-60-11)
Unclassified report

DESCRIPTORS: *Ships (Nonmilitary), *Traffic, Commerce, Fishes, Tables, Navigation, Oceans, Density.

The geographical interests of the Pacific Missile Range cover the entire Pacific Ocean Area and part of the Indian Ocean (to longitude 90 E). Before the interests of the Pacific Missile Range in the Indian Ocean were specifically defined, a study was initiated to determine the density and characteristics of all nonmilitary shipping in the Pacific Ocean. This report presents the results of this study. Numerous sources of data on Pacific shipping were thoroughly searched in this study, including government publications from many nations, books and periodicals, and information procured directly from shipping companies. This vast quantity of available data was sifted to obtain information on the location and density of Pacific shipping and on the size, speed, number of people onboard, and nationality of the vessels employed in various areas for various uses. The nonmilitary shipping was divided into three categories of traffic, (1) that which travels on sea lanes or trade routes, (2) that which operates in coastal or other ''local'' zones, and (3) that which engages in pelagic fishing (away from coastal or local zones). (Author)

20. NUCLEAR PHYSICS AND NUCLEAR CHEMISTRY

AD-296 055 Div. 20
(TISTM/ODN) OTS price $1.60

Naval Radiological Defense Lab., San Francisco, Calif.
A SYSTEM FOR RAPID HANDLING OF AN IRRADIATED SOLUTION,
by A. E. Greendale and D. L. Love. 13 Nov 62, 12p. incl. illus. (Rept. no. NRDL-TR-601)
Unclassified report

DESCRIPTORS: *Radiochemistry, Solutions, Laboratory equipment, Separation, Solvent extraction, Instrumentation.

An apparatus was constructed for rapidly transferring irradiated solutions to a container for fast radiochemical separations. A 'rabbit' containing a solution is irradiated; within 1 second after irradiation it is transported through a pneumatic system to a receiver; there it impales itself onto two hypodermic needles connected to a container under vacuum. The irradiated solution and one acid wash of the rabbit are quantitatively transferred to the container within 2 seconds. Since the system is completely contained, there is no contamination of the laboratory area nor danger to personnel. (Author)

AD-296 230 Div. 20, 25
(TISTM/ODN) OTS price $4.60

David Sarnoff Research Center, Princeton, N. J.
SILVER HALIDE MASS SPECTROGRAPHY,
Final rept.,
by J. R. Woolston. 31 Dec 62, 41p. incl. illus. tables, 6 refs.
(Contract DA 36-034-AMC-3789)
Unclassified report

DESCRIPTORS: *Mass spectroscopy, *Silver compounds, Solids, Crystals, Crystal growth, Processing, Bromides, Chlorides, Halides.

This report describes the results of an investigation to develop techniques for the analysis of silver halides in both solid and powdered form by Spark-Source Mass Spectrography, and reports the results of the analysis of several solid samples, and one powdered sample. A technique utilizing a metallic 'core' of gold wire is described for solid samples which, to a large extent, minimizes thermal limitations imposed by the material. With this technique the three solid samples submitted have been analyzed with sensitivities in the 10-100 ppb range for most impurities. A technique for preparing powder samples for analysis by melting the powder and 'growing' a solid sample on a gold wire support or core is described. After such preparation, which can be done with only a small contamination hazard, the samples are essentially equivalent to the solid samples described above. With this technique the one powder sample submitted has been analyzed with sensitivities in the .1 to 1 part per million range. The techniques used for cutting and cleaning these materials are described. (Author)

Division 20 - NUCLEAR PHYSICS AND NUCLEAR CHEMISTRY

AD-296 248 Div. 20
(TISTP/JW) OTS price $1.10

Naval Civil Engineering Lab., Port Hueneme, Calif.
SIMULATED COLD WEATHER RADIOLOGICAL DECONTAMINATION OF RECOVERY EQUIPMENT,
by Alfred E. Hanna. 15 Jan 63, 12p. incl. illus. (Rept. no. TN-481)
(Proj. Y-F011-05-202) Unclassified report

DESCRIPTORS: *Decontamination, *Radioactive fallout, Pressure, Simulation, Radiation effects, Temperature, Scientific research.

Tests were conducted in Cold Chamber, in which compressed air, steam, vacuum, water, and antifreeze solution were used to remove a fluorescent fallout simulant from a large tractor at temperatures down to minus 10 degrees F. It is concluded that antifreeze solution and water, if warmed, are the most effective materials; steam may be acceptably effective, and air and vacuum have limited use. (Author)

AD-296 257 Div. 20, 4
(TISTM/RGR) OTS price $1.60

Florida U., Gainesville.
THE NUCLEAR PROPERTIES OF RHENIUM.
Quarterly technical progress rept. no. 12, 8 Sep-8 Dec 62,
by R. A. Karam, T. F. Parkinson and others.
8 Dec 62, 16p, incl. illus, table, 9 refs.
(Contract NOa(s) 60-6021-c)
Unclassified report

DESCRIPTORS: *Gold, *Nuclear properties, *Radioactive isotopes, *Radioactive decay, Half life, Nuclear reactions, Nuclear shell models, Neutron cross sections, Nuclear energy levels, Gamma rays, Excitation, Rhenium.

A complete decay scheme of Au-196 and Au-196* is proposed. This decay scheme is based on shell model calculations and experimental measurements of the emitted gamma rays from Au-196 and Au-196*. The half-life of Au-196* was found to be 10.4 hours. The absolute intensity of each gamma ray associated with the decay of Au-196 and Au-196* was obtained. (Author)

AD-296 306 Div. 20, 32
(TISTM/ODN) OTS price $12.50

Lockheed Aircraft Corp., Marietta, Ga.
THIRD SEMI-ANNUAL RADIATION EFFECTS SYMPOSIUM, 28-30 OCTOBER, 1958. VOLUME 1. GENERAL SESSION PAPERS.
1958, 177p. incl. illus. tables, refs. (Rept. no. NR-51, vol. 1)
Unclassified report

DESCRIPTORS: *Symposia, *Radiation effects, Reports, Radiation monitors, Test facilities, Dosimeters, Test equipment, Instrumentation, Health physics, Health physics instrumentation, Radiation damage.

AD-296 307 Div. 20, 32
(TISTM/EJH) OTS price $12.00

Lockheed Aircraft Corp., Marietta, Ga.
THIRD SEMI-ANNUAL RADIATION EFFECTS SYMPOSIUM, 28-30 OCTOBER, 1958. VOLUME 2. DOSIMETRY AND NUCLEAR MEASUREMENTS PAPERS.
1958, 161p. incl. illus. tables, refs. (Rept. no. NR-51, vol. 2)
Unclassified report

DESCRIPTORS: *Radiation damage, *Nuclear reactions, *Symposia, Nuclear cross sections, Gamma rays, Neutrons, Shielding, Radiation monitors, Dosimeters, Scintillation counters, Nuclear reactions, Dielectrics, Boron compounds, Nitrides, Ceramic capacitors.

AD-296 308 Div. 20, 1, 12
(TISTM/EJH) OTS price $12.00

Lockheed Aircraft Corp., Marietta, Ga.
THIRD SEMI-ANNUAL RADIATION EFFECTS SYMPOSIUM, 28-30 OCTOBER, 1958. VOLUME 3. AIRCRAFT SYSTEMS AND MATERIALS PAPERS.
1958, 161p. incl. illus. tables, refs. (Rept. no. NR-51, vol. 3)
Unclassified report

DESCRIPTORS: *Radiation damage, *Symposia, Materials, Aircraft, Electronic equipment, Analog computers, Organic materials, Tires, Flight control systems, Pneumatic systems, Radomes, Semiconductors, Nuclear explosions, Electromagnetic waves, Propagation, Explosive materials, Silicon, Copper, Single crystals, Magnetic materials, Command and control systems.

AD-296 309 Div. 20, 8
(TISTM/EJH) OTS price $21.00

Lockheed Aircraft Corp., Marietta, Ga.
THIRD SEMI-ANNUAL RADIATION EFFECTS SYMPOSIUM, 28-30 OCTOBER, 1958. VOLUME 4. ELECTRONICS AND SEMI-CONDUCTORS PAPERS.
1958, 351p. incl. illus. tables, refs. (Rept. no. NR-51, vol. 4)
Unclassified report

DESCRIPTORS: *Radiation damage, *Symposia, Electronic equipment, Semiconductors, Transistors, Diodes (Semiconductors), Solar cells, Silicon, Circuits, Solar cells, Germanium, Cadmium compounds, Sulfides, Gamma rays, Neutrons, Electron bombardment.

Contents:
The effects of radiation on various resistor types
Radiation effects in compound semiconductors
A critical survey of radiation damage to circuits
Radiation stabilization of transistor circuits by active feedback
Comparison of neutron damage in germanium and silicon transistors
Pulsed radiation effects in semiconductors
The effect of variation of the width of the base region on the radiation tolerance of silicon diodes
The effect of nuclear radiation on commercial silicon diodes
Evaluation of silicon diode irradiation results in terms of magnetic amplifier performance
Gamma radiation effects in silicon solar cells
The effects of nuclear radiation on power transistors
The performance of some Zener reference elements during exposure to nuclear radiation
Effects of electron bombardment on cadmium sulfide whiskers

AD-296 310 Div. 20, 8
(TISTM/EJH) OTS price $17.00

Lockheed Aircraft Corp., Marietta, Ga.
THIRD SEMI-ANNUAL RADIATION EFFECTS SYMPOSIUM, 28-30 OCTOBER, 1958. VOLUME 5. LUBRICANTS AND PLASTICS PAPERS.
1958, 270p. incl. illus. tables, refs. (Rept. no. NR-51, vol. 5)
Unclassified report

DESCRIPTORS: *Radiation damage, *Symposia, Nuclear propulsion, Lubricants, Films, Solids, Fuels, Electronic equipment, Electric insulation, Plastics, Elastomers, Sealing compounds, Silicone plastics, Ionization, Halocarbon plastics, Polymers, Aluminum alloys, Leather, Seaplanes, Sandwich panels, Test methods, Seals.

Contents: Behavior of fuels and lubricants in dynamic test equipment operating in the presence of gamma radiation; Development of nuclear radiation resistant solid film lubricants; Interefects between reactor radiation and MIL-L-7808C aircraft turbine oil; Development of radiation-resistant high-temperature lubricants; Electrical effects of high-intensity ionizing radiation on nonmetals; Study of radiation effects on electrical insulation; Radiation effects on fuel tank sealants and bladder cell material; Effect of electron radiation on the complex dynamic modulus of polystyrene and high density polyethylene; Radiation resistant silicones; Radiation effects on organo-silicons; Effects of gamma radiation on fluorocarbon polymers; Fast neutron activation of seaplane material (This paper is classified and is bound in Volume Six); Effects of nuclear radiation on cork, leather, and elastomers; ''Plate shear method'' of determining the modulus of rigidity of sandwich panels; ''O'' ring testing in a mixed field irradiation; Radiation effects on 23 silicone rubbers at radiation environment due to activation and scattering effects near based seaplanes. (Author)

AD-296 353 Div. 20
(TISTE/OHD) OTS price $2.60

Lockheed Aircraft Corp., Sunnyvale, Calif.
RADIATION DISCRIMINATORS: AN ANNOTATED BIBLIOGRAPHY,
comp. by Charlie M. Pierce. Oct 62, 23p. 57 refs. (Special bibliography no. SB-62-34; Rept. no. 3-80-62-23)
Unclassified report

DESCRIPTORS: *Radiation monitors, *Nuclear particles, *Bibliographies, Gamma counters, Neutron counters, X rays, Protons, Alpha particle detectors, Electron beams, Scintillation counters.

The scope of this search involves instrumentation and circuitry which have been designed to discriminate between the various types of nuclear radiations. A majority of the selected references describe techniques for measuring the intensity of a particular type of radiation in a mixed radiation field. References are arranged by author. (Author)

AD-296 435 Div. 20, 4
(TISTM/SJR) OTS price $1.60

Naval Radiological Defense Lab., San Francisco, Calif.
RAPID RADIOCHEMICAL PROCEDURE FOR ANTIMONY AND ARSENIC,
by A. E. Greendale and D. L. Love. 17 Jan 62, 16p. incl. illus. table, 5 refs. (Rept. no. NRDL-TR-607)
Unclassified report

DESCRIPTORS: *Radiochemistry, *Antimony, *Arsenic, Radioactive isotopes, Contamination, Half life, Tellurium, Iodine, Tin, Armed forces research, Chemical analysis.

A very rapid radiochemical procedure has been developed for antimony and arsenic. A sample is added to a 30 per cent solution of H_2SO_4 containing a carrier for antimony or arsenic (or both). This solution is dropped into a flask containing granular zinc at 100 C. The volatile stibine and/or arsine formed is passed through a hot quartz tube and decomposed to the metal, which collects as a metallic mirror on a cooler portion of the quartz tube. This metal is dissolved in H_2SO_4 and assayed. The chemical yield is consistently between 70 and 80%. The time required for separation of the metal from the other elements of a fission product solution is about 10 seconds. (Author)

AD-296 527 Div. 20, 15
(TISTP/MB) OTS price $2.60

Institute of Engineering Research, U. of Calif., Berkeley.
A DISCUSSION OF THE FEASIBILITY OF ESTIMATING FALLOUT BY REGRESSION METHODS,
by D. C. Kleinecke and R. R. Read. 25 Sep 62, 1v. incl. illus. tables, 10 refs. (Rept. no. CDRP-182-105)
(Contract CD-SR-58-40)
Unclassified report

DESCRIPTORS: *Radioactive fall-out, Radioactivity, Errors, Intensity, Analysis of variance, Measurement, Radiological contamination, Feasibility studies, Statistical analysis.

Statistical multiple regression techniques have been applied to the problems of estimating the deposition coordinates of fallout particles and the radiation intensity levels from the fallout. A stochastic model of the winds aloft is used to reflect the effect of variability due to the passage of time. Wind hodograph information and radiation measurements at ground level serve as regression variables. The error of estimation have been compared with those based on an assumption of persistent winds. The computational problems of attempting to quantify the error of estimating radiation levels are quite difficult and have not been adequately solved. These problems are discussed and some qualified subjective estimates are made concerning the magnitude of these errors. (Author)

AD-296 597 Div. 20, 25
(TISTP/WH) OTS price $1.60

RAND Corp., Santa Monica, Calif.
NOTES ON DEBRIS-AIR-MAGNETIC INTERACTION,
comp. by Conrad L. Longmire. Jan 63, 8p. incl. illus. (Research memo. no. RM-3386-PR)
(Contract AF 49(638)700, Proj. RAND)
Unclassified report

DESCRIPTORS: *Fission products, *Nuclear explosions, *Air, *Magnetohydrodynamics, *Fission product activity, Atmosphere, High altitude, Ions, Differential equations, Terrestrial magnetism.

A set of hydrodynamic-like differential equations

is derived for the motion of debris and air ions as they interact through the magnetic field. Although these equations are not solved in detail, one can deduce several conclusions: (1) at early times, the fraction of the debris mixed with the magnetic field (and hence the intensity of the beta-ray aurora) is proportional to the cube of the time; (2) the outer debris ions are simply bent by the normal earth's magnetic field; and (3) air ions are picked up essentially when the debris has moved one air-ion Larmor radius. (Author)

AD-296 777 Div. 20
(TISTP/JW) OTS price $1.60

Defense Atomic Support Agency, Washington, D. C.
ELECTROMAGNETIC PULSE BIBLIOGRAPHY,
comp. by Charles A. Blank. 17 Jan 63, 15p. refs.
(DASA no. 618)
Unclassified report

DESCRIPTORS: *Nuclear explosions, *Electromagnetic pulses, Electromagnetic properties, Bibliographies.

AD-296 810 Div. 20
(TISTP/JW) OTS price $3.60

Ohio State U. Research Foundation, Columbus.
ELECTRON IMPACT STUDY OF NITROGEN,
by Edwin N. Lassettre and Frederic M. Glaser.
Dec 62, 26p. incl. illus. tables, 18 refs.
(Scientific rept. no. 6)
(Contract AF 19(604)4541, Proj. 7635)
(AFCRL 63-212) Unclassified report

DESCRIPTORS: *Electron bombardment, *Spectrum analyzers, Vacuum apparatus, Ultraviolet spectroscopy, Oscillation, Electrons, Impact shock, Nitrogen, Absorption.

The present study is a reinvestigation of the electron impact spectrum of nitrogen. Electron impact spectra of nitrogen are reported at accelerating voltages of 150, 200, 300, and 400 volts. Since the resolution of the spectrometer is greater than in previous studies, more detailed structure is observed in the spectra and several of the peaks are correlated with bands observed in the vacuum ultraviolet absorption spectrum. A simple method of determining oscillator strengths is used to obtain the oscillator strengths for three prominent peaks. The results are compared with the previous determination. (Author)

AD-296 812 Div. 20
(TISTB/DGH) OTS price $5.60

Office of Special Weapons Developments, Fort Bliss, Tex.
FALLOUT FROM MULTIPLE SURFACE BURSTS.
Feb 63, 1v. incl. illus. tables, refs. (CDOG Study proj. no. OSWD 62-5)
Unclassified report

DESCRIPTORS: *Radiological dosage, *Dose rate, Radioactive decay, Radioactive fallout, Military requirements, Counting methods, Feasibility studies, Radiological contamination, Effectiveness.

AD-296 893 Div. 20, 25, 2, 6
(TISTW/PCR) OTS price $6.60

Columbia Radiation Lab., New York.
RESEARCH INVESTIGATION DIRECTED TOWARD EXTENDING THE USEFUL RANGE OF THE ELECTROMAGNETIC SPECTRUM.
Quarterly progress rept. no. 12, 16 Sep-15 Dec 62,
by R. Novick. 15 Dec 62, 64p. incl. illus. table, refs. (Rept. no. CU-12-62)
(Contract DA 36-039-sc-90789; Continuation of Contract DA 36-039-sc-78330, Proj. 3A99-20-001-09)
Unclassified report

DESCRIPTORS: *Atomic energy levels, *Ionization potentials, *Solid state physics, *Masers, *Radio astronomy, *Cryogenics, *Magnetrons, Ionization, Zinc, Sodium, Rubidium, Cadmium, Krypton, Lithium, Calcium, Strontium, Hyperfine structure, Spectrum analyzers, Ruby, Helium, Optical analysis, Molecules, Lasers, Planetary atmospheres, Superconductors, Resonance.

Contents:
Atomic physics
- Lifetime of the metastable state of singly ionized helium
- Optical detection of level crossings
- Coherence time measurements
- Fine structure of singly ionized lithium
- Hyperfine structure of the stable isotopes

Properties of radioactive atoms
Physics of molecules
Solid state physics
Optical and microwave masers
Radioastronomy
Cryogenics
Magnetrons and special devices

AD-296 934 Div. 20, 25, 15
(TISTW/JEA) OTS price $2.60

Parke Mathematical Labs., Inc., Carlisle, Mass.
ELECTRON STRAGGLING THEORY AND CALCULATION,
by Nathan Grier Parke, III. Aug 62, 16p. incl. table (Scientific rept. no. 10)
(Contract AF 19(604)7316, Proj. 4608)
(AFCRL 62-973) Unclassified report

DESCRIPTORS: *Molecular electronics, *Electron beams, *Energy, *Electron bombardment, *Electrons, *Foils, Ionization potential, Integral equations, Probability, Thickness, Atomic spectroscopy, Integral transforms, Functions, Molecular association, Electron density, Electron multipliers, Electron transistion, Theory, Scattering, Distribution, Resistance (Electrical).

Some conceptual difficulties in the theory of straggling are discussed and Landau's 1934 result is compared with that obtained by the method of random energy walk over successive impacts. Landau's differential equation is rederived and basic assumptions stated. In the course experimental work on the effect of the passage electrons through a foil on its resistivity, some routine calculations were undertaken of the distribution of the electron energy losses about the mean at different depths in the foil. (Author)

AD-296 963 Div. 20, 25, 4
(TISTM/ODN) OTS price $2.60

Pasteur Inst. (France).
PHOTO-ACTIVATED PRODUCTION OF FREE RADICALS FROM DIATOMIC MOLECULES AFTER ADSORPTION ON METALLIC SURFACES.
Annual progress rept., 1 Nov 61-30 Oct 62,
by C. M. Moser. 30 Oct 62, 19p. incl. tables.
(Contract DA 91-591-EUC-1897)
Unclassified report

DESCRIPTORS: *Hyperfine structure, *Carbon compounds, *Organic compounds, *Benzene (Radical), Atomic energy levels, Atomic properties, Nitrogen compounds, Oxides, Titanium compounds, Atomic orbitals, Hydrocarbons, Magnetic properties, Fluorine, Boron, Oxygen, Energy, Excitation, Atomic spectroscopy, Monoxides.

Calculations for several atomic hyperfine structure spectra constants for various states of S, N, P, B, O, F, and N have been completed. The kind of wave function which can now be calculated from currently available machine programs are adequate to give qualitative agreement with experiment. All known electronic excited states of carbon monoxide have been studied. (Author)

AD-296 972 Div. 20, 15, 25
(TISTW/JEA) OTS price $3.60

Uppsala U. (Sweden).
ON THE THEORETICAL FOUNDATION OF THE ONE-ELECTRON APPROXIMATION,
by Lars T. Hedin. 1 Sep 62, 33p. incl. illus. 38 refs. (Technical note no. 84)
(Contract AF 61(052)351)
(ARL 62-459) Unclassified report

Presented at the International Symposium on Local Properties of Perfect Crystals, during the period July 16-July 24, 1962, held at the Institut Battelle, Carouge/Geneva, Switzerland.

DESCRIPTORS: *Particles, *Numerical analysis, *Excitation, *Ions, *Electrons, Correlation techniques, Energy, Atomic energy levels, Perturbation theory, Radioactive decay, Density, Green's function, Statistical functions, Probability, Matrix algebra, Amplitude modulation, Continuum mechanics, Semiconductors, Atomic properties, Atomic orbitals, Nuclear particles, Polarization, Atomic structure.

The first part of this paper contains a qualitative discussion of the one-electron approximation and a rough review of the Bohm-Pines, van Hove-Hugenholtz and Luttinger work. These works can be considered as representative of that part of current many-body literature which aims directly at the behavior of quasi-particles in normal many-fermion systems. The second part tries to elaborate a specific method to handle quasi-particles. The method is formally similar to the usual Hartree-Fock scheme and it was chosen out of many possible approaches partly because the author has been actively working with it and partly because it is fairly simple and still illustrates the ideas and scope of present day many-body theories. (Author)

21. NUCLEAR PROPULSION

No Entries

22. ORDNANCE

AD-296 194 Div. 22
(TISTM/RGR) OTS price $8.60

Laboratories for Research and Development, Franklin Inst., Philadelphia, Pa.
DEVELOPMENT OF BROAD-BAND ELECTROMAGNETIC ABSORBERS FOR ELECTRO-EXPLOSIVE DEVICES.
Final rept., June 61-June 62,
by Paul F. Mohrbach and Robert F. Wood. June 62, 83p. incl. illus. tables (Rept. no. F-B1857)
Unclassified report

DESCRIPTORS: *Electromagnetic shielding, *Ordnance, *Radio waves, Attenuation, Ferrites, Preparation, Hazards, Electric igniters, Electromagnetic waves, Safety, Barium compounds, Titanates, Explosive initiation, Electric detonators, Electromagnetic fields, Radiofrequency, Electric insulation, Ceramic coatings, Titanium compounds, Dioxides, Effectiveness, Absorption.

Some unusual materials and methods for eliminating unwanted RF energy are investigated. Electroluminescent phosphors, electroluminescent-photoconductive circuitry and dissipative filter networks were the topics studied. Phosphors do not at present form a probable solution of RF control, while electroluminescent-photoconductive circuitry and dissipative filters seem promising but require further development. Our success with carbonyl iron resulted in a valuable contribution to the protection of ordnance devices from the hazards of electromagnetic radiation. However, it is limited in its effectiveness to frequencies of 100 Mc and up. Our experience has indicated that it is possible to obtain appreciable values of attenuation at frequencies of 1 Mc - 100 Mc by the use of a class of materials called ferrites. We have therefore conducted a study of ferrite materials. (Author)

AD-296 388 Div. 22
(TISTB/MS) OTS price $7.60

Lovelace Foundation for Medical Education and Research, Albuquerque, N. Mex.
TRANSLATIONAL EFFECTS OF AIR BLAST FROM HIGH EXPLOSIVES.
Technical progress rept.,
by I. Gerald Bowen, Paul B. Woodworth and others. 7 Nov 62, 77p. incl. illus. tables.
(Contract DA 49-146-xz-055)
(DASA-1336) Unclassified report

Presented at the Symposium on Effectiveness Analysis Techniques for Non-Nuclear Warheads Against Surface Targets, U. S. Naval Weapons Laboratory, 30 Oct 1962, Dahlgren, Va.

DESCRIPTORS: *Blast, Acceleration, Pressure, Time, Biophysics, Nuclear explosions, Mathematical analysis.

The results of a theoretical study concerning computed velocity, displacement, and acceleration as functions of time for a variety of objects exposed to blast waves with 12 maximum overpressures ranging from 1 to 20 atm are presented. Although all computations were made for 1 ton of high explosives burst in free air, the results may be readily scaled to lower or higher yields and to surface bursts. The translated objects, or missiles, are identified in this study by their acceleration coefficients which range from 0.01 to 6.0 sq ft/lb. (Author)

AD-296 417 Div. 22, 15
(TISTW/PCR) OTS price $6.60

Feltman Research Labs., Picatinny Arsenal, Dover, N. J.
THE COMBUSTION OF A GRANULAR MIXTURE OF POTAS-

SIUM PERCHLORATE AND ALUMINUM CONSIDERED AS EITHER A DEFLAGRATION OR A DETONATION,
by Joseph Hershkowitz. Jan 63, 61p. incl. illus. tables, 66 refs. (Technical rept. no. 3063)
(DA Proj. 5030-4002)
Unclassified report

DESCRIPTORS: *Deflagration, *Detonation, Combustion, Mixtures, Potassium compounds, Perchlorates, Aluminum, Diffusion, Molecular properties, Thermal diffusion, Sound, Velocity, Dust explosions, Gases, Elasticity, Solids, Hydrodynamics, Theory, Mathematical analysis, Equations, Numerical analysis, Partial differential equations, Explosive materials.

The combustion front in a column of a granular mixture of potassium perchlorate and aluminum has been observed to propagate stably at either a low speed (300m/s) with a short reaction zone (2 cm), or a high one (900 m/s) with an elongated reaction zone (8 cm), and with an occasional rapid transition between them. Calculations are made to categorize the observed phenomena as those of either a deflagration or a detonation. (Author)

AD-296 424 Div. 22, 9
(TISTW/PCR) OTS price $2.60

Naval Ordnance Lab., White Oak, Md.
UNDERWATER EXPLOSION PHENOMENA: THE PARAMETERS OF MIGRATING BUBBLES,
by Hans G. Snay. 12 Oct 62, 25p. illus. 10 refs.
(NAVORD rept. no. 4185)
Unclassified report

DESCRIPTORS: *Explosion bubbles, *Underwater explosions, Gravity, Buoyancy, Energy, Analysis, Oscillation, Hydrodynamics, Equations, Mathematical analysis.

The migration of underwater explosion bubbles caused by gravity (buoyancy) affects the energy of the pulsation as well as period and maximum radius in the second and subsequent cycles. Experimental data on periods of explosions in various depths are analyzed, and the bubble energy is determined for five cycles of the oscillation as a function of the strength of migration. The result is given in dimensionless form which permits the calculation of periods, maximum radii, and migration for a wide range of conditions. An energy balance shows the surprising result that the bubble energy of the second cycle increases with increasing intensity of migration until a maximum is reached at a condition of strong migration. Beyond this point, the energy decreases again. This gain is found to be due to the decrease of the energy radiated by the bubble pulse. (Author)

AD-296 582 Div. 22
(TISTW/PCR) OTS price $1.60

Joint Army-Navy-Air Force Fuze Committee, Washington, D. C.
HUMIDITY AS A FACTOR IN FUZE DESIGN AND EVALUATION,
by A. W. Baldwin. 1 Feb 63, 13p. incl. tables, refs. (Serial no. 26)
(In cooperation with Naval Ordnance Lab., White Oak, Md.)
Unclassified report

DESCRIPTORS: *Fuzes, Design, Moisture, Effectiveness, Degradation, Moisture-proofing, Seals (Stoppers), Desiccants, Materials, Corrosion, Tests, Test methods, Instrumentation, Hygrometers, Humidity.

Fuzes which cannot be inspected or serviced during storage or prior to use must be designed to withstand the deteriorating effects of humidity. Humidity in the atmosphere is a slow but persistent deteriorating force on corrodable and organic materials. Some methods of design to avoid problems and several frequently used tests for humidity effects are suggested. (Author)

AD-296 587 Div. 22, 15
(TISTW/PCR) OTS price $9.10

Rock Island Arsenal Lab., Ill.
THEORETICAL STUDY OF THE BLAST FIELD OF ARTILLERY WITH MUZZLE BRAKES,
by George Schlenker. Dec 62, 103p. incl. illus. tables, 18 refs. (Rept. no. 62-4257)
(Proj. 5W01-01-034)
Unclassified report

DESCRIPTORS: *Blast, *Shock waves, *Gun barrel attachments, Hazards, Pressure, Mathematical analysis, Equations, Programming (Computers), Digital computers, Computer logic, Tables, Bibliographies, Theory, Artillery.

A means is described for computing the peak static and peak dynamic overpressures of the shock wave generated by an artillery piece with muzzle brake as a function of position within the crew area. Computed results are compared with recent experimental results and indicate a favorable agreement. (Author)

AD-296 754 Div. 22
(TISTW/PCR) OTS price $3.60

Aeronautical Systems Div., Air Force Systems Command, Wright-Patterson Air Force Base, Ohio.
EXTERIOR BALLISTICS OF THE AR-15 RIFLE,
by Robert W. Cross. Jan 63, 35p. incl. illus. tables, 6 refs. (Rept. no. ASD TDR 63-2)
(Proj. 912A-0000-97205)
Unclassified report

DESCRIPTORS: *Small arms, *Small arms ammunition, Test methods, Projectiles, Stability, Kill probabilities, Penetration, Deflection, Exterior ballistics, Terminal ballistics, Configuration, Velocity, Rifling, Temperature, Air, Density, Atmospheric temperature, Mathematical analysis, Equations, Design, Tests.

Bullet stability, lethality, penetration, and deflection were subjects of the physical testing conducted to provide a basis for certain design decisions involving the AR-15 rifle. In addition, bullet shape and muzzle velocity with regard to stability are discussed. (Author)

AD-296 768 Div. 22, 4
(TISTW/PCR) OTS price $2.60

Scintilla Div., Bendix Corp., Sidney, N. Y.
SQUIB DEVELOPMENT PROGRAM.
Quarterly rept. no. 2, 30 Sep-31 Dec 62,
by Rolland M. Purdy, Sr. 31 Dec 62, 18p. incl. illus. tables.
(Contract N178-8081)
Unclassified report

DESCRIPTORS: *Explosives initiators, *Hazards, *Semiconductors, Stability, Sparks, Tests, Test methods, Diaphragms (Mechanics), Electrodes, Resistance (Electrical), Thickness, Silicon alloys, Carbides, Molybdenum compounds,

Silicides, Aluminum compounds, Oxides, Ceramic materials, Glass, Glass seals, Thermal conductivity, Lithium compounds, Manganese compounds, Bismuth compounds, Design, Probability, Naval research, Radiofrequency, Materials.

The prospect of obtaining a material which will limit firing energies to desired values, will maintain stability after repeated firings, and will also possess desirable manufacturing characteristics seems reasonable. Spark testing has been conducted to determine the correlation between the energy to rupture the diaphragm and combinations of electrode to electrode resistance, diaphragm thickness, and spark chamber volume. One hundred ninety squibs were shipped to Flare-Northern Division of Atlantic Research Corp. for loading and firing using various explosive mixtures. Results are reported herein. Future work is also indicated. (Author)

AD-296 865 Div. 22
(TISTW/JEA) OTS price $1.10

Army Missile Command, Redstone Arsenal, Huntsville, Ala.
THE EFFECTS OF RF ENERGY ON THE XM 6 AND XM8 EBW SQUIBS,
by D. L. Thomson, J. W. Vann and W. L. Strickland. 15 Jan 63, 8p. incl. illus. (Rept. no. RK-TR-63-1)
Unclassified report

DESCRIPTORS: *Explosives initiators, *Radio frequency, *Electric igniters, *Electric detonators, Energy, Ceramic materials, Explosive materials, Antennas, Radar transmitters, Radio transmitters, Impedance matching, High frequency, Very high frequency, Detonation, Epoxy plastics, Detonators, Vulnerability, Flight testing, Hazards, Radiation effects.

The XM6 and XM8 exploding bridgewire squibs were tested to determine their susceptibility to radio frequency energy. In the course of the tests, both types of squibs were fired with RF energy, using an impedance matching network to effect efficient transfer of power through a transmission line. No firings were obtained where the power was broadcast. As expected, the energy levels required for initiation were much higher than that required for conventional squibs. (Author)

AD-296 885 Div. 22, 8
(TISTW/RD) OTS price $2.60

Laboratories for Research and Development, Franklin Inst., Philadelphia, Pa.
HERO SUPPORTING STUDIES.
Monthly progress rept. no. 4, 1-31 Oct 62,
by Norman P. Faunce and Paul F. Mohrbach. 31 Oct 62, 22p. incl. illus. tables (Rept. no. P-B1980-4)
(Contract N178-8102)
Unclassified report

DESCRIPTORS: *Electromagnetic fields, *Electromagnetic waves, *Radiofrequency, Electric detonators, Electric igniters, Electrical impedance, Safety, Hazards.

Preliminary evaluations of protected MARK 7 MOD 0 ignition element plug assemblies indicate losses of 1.43 and 3 db respectively at 80 and 200 mc. These estimates are derived from analyzing the component as an equivalent symmetrical T-network; the parameters of the network are derived from measurements of open and short circuit input impedance. Though the resulting estimates appear high, the method warrants further study. A constant current functioning test of this element shows it to be more sensitive than its unprotected counterpart; it requires only 7.8 amperes compared to 9.2 amperes at 0.1 msec for 50% functioning. Dynamic resistance which ranges from 55 ohms/second at 3 amperes input to 956 ohm/second at 10 amperes was determined also for the protected MARK 7 element. Its thermal time constant was found to be 11.6 msec. Additional investigations into means for measuring power to the base of an arbitrary termination proceeded along the line of comparing differential power measurements to measurements derived from detecting the maximum and minimum voltages on a slotted line preceding the load. The latter technique, called the voltage min-max method, appears to be superior to any new technique tried to date. (Author)

23. PERSONNEL AND TRAINING

AD-296 022 Div. 23
(TISTB/DGH) OTS price $2.60

Matrix Corp., Arlington, Va.
A FIELD SURVEY OF A SELF-TUTORING COURSE FOR ON-SITE TRAINING IN SAGE AN/FST-2 TROUBLESHOOTING,
by Edward C. Weiss. Nov 62, 25p. incl. table, 3 refs. (Matrix rept. no. 62-11)
(Contract AF 19(628)1953)
(ESD TDR 62-346) Unclassified report

DESCRIPTORS: *Maintenance personnel, Performance tests, Training devices, Effectiveness, Training.

AD-296 541 Div. 23
(TISTB/DGH) OTS price $3.60

Bureau of Naval Personnel, Washington, D. C.
TRAINING, UTILIZATION, AND PROFICIENCY OF NAVY ELECTRONICS TECHNICIANS. IV. PROFICIENCY IN MATHEMATICS,
by Adolph V. Anderson. Oct 62, 25p. incl. illus. tables, 3 refs. (Technical bulletin no. 62-16)
Unclassified report

DESCRIPTORS: *Training, *Electronics, Technological intelligence, Effectiveness, Mathematics, Achievement tests, Maintenance personnel, Naval personnel.

AD-296 936 Div. 23
(TISTB/DGH) OTS price $4.60

6570th Personnel Research Lab., Aerospace Medical Div. Lackland Air Force Base, Tex.
ABSTRACTS OF PERSONNEL RESEARCH REPORTS: I. 1954-1957,
comp. by Helen Tomlinson and Jo Ann Elson. Dec 62, 44p. (Rept. no. PRL TDR 62-25)
(Projs. 7717, 7719)
Unclassified report

DESCRIPTORS: *Air force research, *Personnel, Selection, Acceptability, Abstracts, Training, Motivation, Performance tests, Effectiveness, Officer personnel, Aviation personnel, Aptitude tests, Test construction (Psychology), Job analysis, Personality, Recruiting, Reports, Classification.

Division 24 - PHOTOGRAPHY AND OTHER REPRODUCTION PROCESSES

AD-296 937 Div. 23
(TISTB/DGH) OTS price $3.60

6570th Personnel Research Lab., Aerospace Medical Div., Lackland Air Force Base, Tex.
ABSTRACTS OF PERSONNEL RESEARCH REPORTS: II. 1958-1961,
comp. by Helen Tomlinson and Jo Ann Elson.
Dec 62, 38p. (Rept. no. PRL TDR 62-26)
(Projs. 7717, 7719, 7734)
Unclassified report

DESCRIPTORS: *Air force research, *Personnel, Selection, Acceptability, Abstracts, Training, Motivation, Performance tests, Effectiveness, Officer personnel, Aviation personnel, Aptitude tests, Test construction (Psychology), Job analysis, Personality, Recruiting, Reports, Classification.

AD-296 997 Div. 23
(TISTB/DGH) OTS price $2.25

Matrix Corp., Arlington, Va.
DEVELOPMENT OF QUALITATIVE AND QUANTITATIVE PERSONNEL REQUIREMENTS INFORMATION.
Final report on Training Personnel, and Psychological Stress Aspects of Bioastronautics,
by Robert G. Demaree, Melvin R. Marks and others.
Dec 62, 82p. incl. illus. 21 refs.
(Contract AF 33(616)7464, Proj. 1710)
(MRL TDR 62-4) Unclassified report

DESCRIPTORS: *Personnel, *Training, Training devices, Guided missile personnel, Job analysis, Air Force, Selection, Military requirements, Effectiveness.

This report describes the nature of, purpose and method for developing Qualitative and Quantitative Personnel Requirements Information (QQPRI). The report is intended to aid Air Force and contractor personnel in the development and use of QQPRI. The first section of the report covers the nature and scope of QQPRI and relationship of QQPRI to system development. The second section describes the general constraints within which QQPRI is developed. Such constraints include technical weapon system constraints as well as policies on Air Force Personnel, Training and Manning. The third and largest section covers QQPRI development techniques such as task analyses, estimation of performance time, establishing Air Force positions and determining the relation of these to existing Air Force specialities. The fourth section covers the QQPRI Report, its preparation and uses. (Author)

24. PHOTOGRAPHY AND OTHER REPRODUCTION PROCESSES

AD-296 031 Div. 24, 25, 6
(TISTA/VGW) OTS price $1.60

Naval Radiological Defense Lab., San Francisco, Calif.
PHOTOMICROGRAPHIC TECHNIQUE FOR MEASURING GRAIN DENSITIES OF HIGHLY IONIZED PARTICLE TRACKS IN NUCLEAR EMULSIONS,
by E. V. Benton. 26 Oct 62, 13p. incl. illus. 8 refs. (NRDL rept. no. TR-591)
Unclassified report

DESCRIPTORS: *Photomicrography, *Particle trajectories, Measurement, Effectiveness, Ion beams, Photographic emulsion.

A technique for rapid and accurate measurements of gap lengths of nearly saturated particle tracks in nuclear emulsions is reported. The method consists of obtaining photomicrographs of particle tracks with a superimposed image of a calibrated eyepiece-micrometer disc. The gap lengths are measured to an accuracy of 1/4 micron. (Author)

AD-296 979 Div. 24, 25
(TISTW/JEA) OTS price $1.00

Directorate of Engineering Test, Aeronautical Systems Div., Wright-Patterson Air Force Base, Ohio.
A CONTRIBUTION TO THE THEORY OF SCHLIEREN SENSITIVITY AND QUANTITATIVE EVALUATION.
Final rept.,
by Lee Kean. Dec 62, 30p. incl. illus. 17 refs.
(Proj. 1426)
(ASD TDR 62-924) Unclassified report

DESCRIPTORS: *Schlieren photography, *Diffraction, *Temperature, *Light, *Optical equipment, Errors, Focusing, Light transmission, Distribution, Optical images, Interferometers, Spectrophotometers, Configuration, Illumination, Cameras, Color, Theory, Sensitivity, Measurement, Sources, Detectors.

Detectors used to evaluate schlieren images have a response proportional either to the illumination or to the logarithm of the illumination. Sensitivity point functions appropriate to both kinds of response are defined analytically. These functions are well defined even in the presence of optical system imperfections and are not referenced to the clear field illumination. By the choice of an appropriate system configuration, either function can be reduced to a constant. It is shown that, in principle, the light deviation values required for quantitative evaluation can be found by subtracting out the illumination increments due to diffraction and other system errors. A qualitative treatment of schlieren diffraction from the point of view of the Thomas Young theory is given. A technique is described for obtaining a stigmatic source image with an offset two-mirror schlieren system. A simple method for obtaining simultaneous vertical and horizontal knife-edge schlieren pictures is given. A means for magnifying sensitivity without the use of long focal length mirrors is described. A new method for measuring gas temperatures, which involves crossing a color schlieren system with a spectrograph, is described. (Author)

25. PHYSICS

AD-296 009 Div. 25
(TISTM/ODN) OTS price $1.60

Brown U., Providence, R. I.
METHOD FOR MEASURING SONIC DISLOCATION VELOCITIES,
by J. A. Carlsson and J. J. Gilman. Dec 62, 7p. illus. (Technical rept. no. 4)
(Contract Nonr-56232)
Unclassified report

DESCRIPTORS: *Crystals, Velocity, Sound, Stresses, Lithium compounds, Fluorides, Deformation, Creep, Measurement, Explosive materials, Loading (Mechanics), Crystal lattice defects.

This report presents a new technique for applying dynamic stresses to elastic-plastic specimens. Outstanding features of the method are its simplicity and the well defined state of stress that it produces. Intensity of the stress and the stress-rate can be varied over a larger range than most other methods allow. Although the method was developed for studying high-speed dislocation motions in crystals, it can readily be adapted to studies of macroscopic plastic flow. (Author)

AD-296 035 Div. 25
(TISTP/TL) OTS price $1.60

Theoretical Chemistry Inst., U. of Wisconsin, Madison.
A STUDY OF ONE AND TWO ELECTRON CENTRAL FORCE PROBLEMS USING THE HYPERVIRIAL THEOREM,
by Sidney L. Gordon. 10 Jan 63, 21p. incl. illus. tables, 12 refs. (Rept. no. WIS-TCI-8, series no. 3)
(Contract AF 33(616)7311 and Grant NsG-275-62(4180))
Unclassified report

DESCRIPTORS: *Quantum mechanics, *Functions, *Operators (Mathematics), *Electrons, Hydrogen compounds, Atoms, Oscillators, Real variables, Kinetic theory, Potential theory, Atomic orbitals, Theory, Analysis, Atomic properties.

The hypervirial theorem is used to develop expectation value relationships for one and two electron central force problems. Ground-state helium trial functions are scaled to identically satisfy a particular family of these relationships. It is shown that this procedure results in improved expectation values for positive powers of the radial coordinate. (Author)

AD-296 086 Div. 25, 8
(TISTE/CRJ) OTS price $1.60

Bulova Watch Co., Woodside, N. Y.
DESTRUCTIVE LEAK TEST COMPARISON FOR TWO AVAILABLE HC-6/U BASES.
Special rept.,
by A. S. Matistic. 1963, 10p. incl. illus. tables.
(Contract DA 36-039-sc-81271)
Unclassified report

DESCRIPTORS: *Crystal holders, Crystals, Low frequency, Nickel, Iron alloys, Temperature, Test methods, Resistance (Electrical), Helium, Epoxy plastics, Tests.

Destructive leak tests were performed on 400 crystal units consisting of 200 units fabricated with each of two HC-6/U base designs. The tests are of general interest since many MIL-type crystal units are housed in HC-6/U holders. Two destructive test conditions are described: accelerated thermal shock tests and HC-6/U terminal-pin bending tests. In these tests, 100 crystal units of each of the two HC-6/U base designs were allocated to each of the two destructive tests. For measuring resulting leak rates, a Veeco (Model MS-9ABC) Mass Spectrometer Leak Detector was employed; crystal units exhibiting leak rates exceeding 10 to the -6th power cc/s were classified as rejects. A comparison of cumulative leak rejects indicates significant differences in survival capability for the two HC-6/U base designs tested. The more rugged HC-6/U base type can be advantageously employed for low freqency crystals; at higher frequencies, it has limited application because adverse holder inductance and holder resistance effects are introduced. (Author)

AD-296 092 Div. 25, 4, 15, 8
(TISTP/MH) OTS price $1.10

Aerospace Information Div., Washington, D. C.
A.I.D. PRESS.
28 Jan 63, 6p. (Rept. no. 886)
Unclassified report

DESCRIPTORS: *Plasma physics, *Electromagnetic, waves, *Electromagnetic fields, *Cathodes, Modulation, Antioxidants, Magnetic fields, Attenuation, Perturbation theory, Electron tubes.

Contents:
Effect of radiation processes on transfer phenomena in plasma in a strong magnetic field
Dispersion functions for refractive index and absorption factor in media with exciton absorption
Influence of local perturbations of magnetic field on containment of particles in magnetic adiabatic trap
Dynamic friction and diffusion in plasma
Azimuthal mu-meson telescope
Properties of absolutely stable sampled-data automatic system
Optimization of terminal control problems
Use of field-emission cathode in microtron
Measurement of small phase-modulation indexes
New oxidation inhibitor for fuels containing unsaturated hydrocarbons
Extraction of Th and Ce (IV) by tributyl phosphate

AD-296 106 Div. 25, 9
(TISTP/WH) OTS price $3.60

Boeing Scientific Research Labs., Seattle, Wash.
INTERACTION OF A PLANE JET WITH A MAGNETIC FIELD,
by F. D. Hains. Dec 61, 1v. incl. illus. 3 refs.
(Flight Sciences Lab. rept. no. 55; D1-82-0147)
Unclassified report

Also available from the author.

DESCRIPTORS: *Plasma jets, *Magnetohydrodynamics, Numerical methods and procedures, Partial differential equations, Magnetic fields, Supersonic nozzles.

An analysis is made of the distortion of a plane, supersonic free jet by a strong magnetic field. The field is created by a straight wire placed outside of the jet and normal to the plane of flow. The entire flow field is obtained numerically by the method of characteristics for several locations of the wire when the magnetic Reynolds number is small. The magnetic field

tends to decelerate the flow to sonic velocity without the formation of shocks. The resultant force acting on the wire is found to vary linearly with the interaction parameter N for values of N as large as 0.1. (Author)

AD-296 133 Div. 25, 8
(TISTE/CRJ) OTS price $4.60

RCA Labs. Div., Radio Corp. of America, Princeton, N. J.
THEORETICAL AND EXPERIMENTAL STUDY OF THE COMBINED HALL-MAGNETO RESISTANCE EFFECT.
Scientific rept. no. 2, 1 Nov 61-31 Oct 62,
by K. K. N. Chang, P. E. Chase and H. J. Prager. 31 Oct 62, 42p. incl. illus. table, 11 refs.
(Contract AF 19(628)262)
(AFCRL 62-918) Unclassified report

DESCRIPTORS: *Semiconductor devices, *Hall effect, *Diodes (Semiconductors), Microwave equipment, S band, Frequency converters, Radiofrequency amplifiers, Microwave amplifiers, Magnetic fields, Transmission lines, Solid state physics, Indium compounds, Antimony alloys, Ferrites, Dielectrics, Single crystals, Mathematical analysis, Germanium, Arsenides, Radiofrequency power, Theory, Modulators.

A new group of microwave devices based on the Hall-Effect is being sought. Following a preliminary study of a 2 mc amplifier, with an electronic gain of 43 db, a frequency converter at the S-band region of the microwave spectrum was built and gave a conversion loss of 20 to 30 db. Attempts are being made to combine the Hall sample with special materials such as rutile or YIG to achieve better conversion gain by improving the coupling to the RF magnetic fields. A novel scheme based entirely on enhanced interaction between the Hall sample and its associated circuitry was proposed and analytically examined. The first experimental embodiment of this proposed scheme seems to have yielded a small net gain at a frequency of 3730 mc. Also included are the results of various experiments on microwave Hall-Effect isolators, as well as on fabrication techniques for millimeter wave tunnel diodes. These tunnel diodes were operated as detectors at a frequency of 55 gc. An improvement in sensitivity of 25 db as compared to ordinary crystal detectors was obtained. (Author)

AD-296 159 Div. 25, 17
(TISTM/BRW) OTS price $6.60

Syracuse U. Research Inst., N. Y.
CRACK INITIATION IN METALLIC MATERIALS.
Final rept.,
by V. Weiss, K. Schroder and others. Nov 62, 1v. incl. illus. tables, refs. (Rept. no. MET. 878-6211-F)
(Contract NOw 61-0710-d)
Unclassified report

DESCRIPTORS: *Metals, Tungsten, Titanium alloys, Sheets, Deformation, Stresses, Failure (Mechanics), Theory, Lithium compounds, Fluorides, Single crystals, Crystal lattice defects, Aluminum alloys, Vanadium alloys, Silver compounds, Chlorides, Fracture (Mechanics).

Conditions for crack initiation as a function of test specimen geometry, test material, testing conditions and internal structure of the material were investigated. Tungsten and titanium sheet specimens were selected for the studies. Lithium fluoride and silver chloride were utilized to yield information concerning the dislocation motion and arrangement at and near existing cracks. Experimental results include the study of the effects of recrystallization on fracture strength of notched tungsten specimens, of surface condition of smooth and notched titanium and tungsten specimens as well as a description of dislocation arrangements in lithium fluoride single crystals near existing cracks. Tensile and notch tensile specimens containing machined and fatigue-cracked notches were utilized. Selected tungsten and titanium specimens were tested after the surface had been electropolished and the notch root had been prepared by electrolytical machining. (Author)

AD-296 164 Div. 25, 17
(TISTM/BRW) OTS price $5.60

Aeon Labs. (Gt. Brit.).
THE DEFORMATION OF SECTIONS DURING CUTTING.
Final technical rept. for period ending 31 Oct 62.
31 Dec 62, 35p. illus. 23 refs.
(Contract DA 91-591-EUC-1709, Proj. 01-7480-61)
Unclassified report

DESCRIPTORS: *Metals, *Microtomes, Shear stresses, Friction, Plasticity, Deformation, Crystal structure, Surfaces, Machining, Microscopy.

AD-296 176 Div. 25, 2
(TISTP/TL) OTS price $9.10

California U., Berkeley.
A STUDY OF IONOSPHERIC ABSORPTION PRODUCED BY SOLAR COSMIC RAYS.
by Robert Anthony Weir, Jr. 1962, 73p. illus. 32 refs.
(Contract AF 49(638)873)
(AFOSR-4548) Unclassified report

DESCRIPTORS: *Ionospheric propagation, *Solar radiation, *Extraterrestrial radio waves, *Electrons, Recombination reactions, Solar flares, Experimental data, Density, Earth, Magnetic fields, X rays, Instrumentation, Absorption, Cosmic rays, Radio interference, Ionization.

Absorption of cosmic radio noise in lower ionosphere due to arrival of solar cosmic rays has been calculated for several locations at high magnetic latitudes. Calculation was made in three parts; volume production rate of electrons from ionization, equilibrium electron density resulting from competition between production and recombination processes, and absorption of electro magnetic radiation passing through ionized region. Calculation was made for proton energy spectra in the form of power law as observed by balloon-borne detectors following large solar flares. Calculated absorption was compared with observations obtained by riometers (relative ionospheric opacity meter) at Point Barrow, Fort Yukon, College, and Farewell, Alaska. (Author)

AD-296 180 Div. 25, 9
(TISTP/JW) OTS price $8.60

Hydraulic Engineering Lab., U. of Calif., Berkeley.
INVESTIGATION ON A TWO-PHASE PROBLEM IN CLOSED PIPES,
by Walter Hans Graf. Dec 62, 89p. incl. illus. tables, 12 refs. (Technical rept. no. HEL-2-2)
(Contract DA 49-055-civ-eng-63-4)
Unclassified report

DESCRIPTORS: *Fluid flow, *Venturi tubes, Pipes, Pressure, Energy, Motion, Acceleration, Deceleration, Liquids, Measurement.

AD-296 189 Div. 25, 9
(TISTP/JW) OTS price $1.10

Electrical Engineering Research Lab., U. of Illinois, Urbana.
STUDIES IN QUANTUM AND SOLID STATE ELECTRONICS. Final rept.
1 Feb 63, 5p. 3 refs.
(Grant AF-AFOSR 62-287, Proj. 9768)
(AFOSR-2099) Unclassified report

DESCRIPTORS: *Quantum mechanics, *Electronics, Microwaves, Resonators, Harmonic analysis, Laser, Theory, Solid state physics.

AD-296 196 Div. 25, 8
(TISTP/MB) OTS price $2.60

Boeing Scientific Research Labs., Seattle, Wash.
THE EXTERIOR PROBLEM FOR THE VECTOR WAVE EQUATION IN AN INHOMOGENEOUS ANISOTROPIC MEDIUM,
by William C. Hoffman. Nov 62, 26p. (Mathematical note no. 278; Document no. D1-82-0212)
Unclassified report

Also available from the author.

DESCRIPTORS: *Electromagnetic fields, Anisotropy, Integral equations, Electromagnetism, Wave transmission, Spheres, Propagation, Mathematical analysis.

The vector wave equation for an electromagnetic field outside a perfectly conducting sphere situated in an inhomogeneous anisotropic medium is reduced, by means of a dyadic Stratton-Chu formula, to an equivalent vector integral equation. The anisotropy is presumed to arise from a magnetic dipole at the center of the sphere, so that the kernel of the integral equation consists of the inner product of the appropriate conductivity tensor and the Green's dyadic (in a form due to C. T. Tai) for a sphere in free space. The spherical vector wave functions involved are discussed, and various transformations are applied to render the vector integral equation more tractable. Finally, the vector system is reduced to a single scalar integral equation apparently more suited to numerical solution through proper redefinition of the domain of integration. (Author)

AD-296 206 Div. 25
(TISTM/ODN) OTS price $1.60

Space Technology Labs., Inc., Redondo Beach, Calif.
LOSS OF STABILITY OF THIN ELASTIC SHELLS UNDER THE EFFECT OF IMPULSIVE LOADS (O Potere Ustoichivosti Tonkikh Uprugikh Obolochek pod Deistviem Impulsivnoi Nagruzki),
by V. V. Bolotin, G. A. Boichenko and others, tr. by Z. Jakubski. Jan 63, 12p. incl. illus. 4 refs. (Rept. no. 9990-6351-KU-000; Trans. no. 73 from Stroitelnaya Mekhanika i Raschet Sooruzhenii No. 2, pp. 9-16, 1959)
Unclassified report

DESCRIPTORS: *Elastic shells, Loading (Mechanics), Elasticity, Differential equations, Theory, Nonlinear differential equations, Analog computers, Mathematical analysis, Stability.

The problem of the stability of a cylindrical panel resting on a rectangular boundary, under the effect of a normal impulse which is characterized by a rapid increase in load to a certain magnitude and subsequent decrease according to the exponential law is discussed. The main objective is to construct a range of parameters which characterizes this impulse and in the presence of which snap-through buckling of the shell does not occur (i.e., stability 'in the large'). The effect of the initial compression and damping decrements on the boundary of the stability region, as well as on the maximum deflections attainable under the effect of the impulse were investigated. Partial differential equations of the nonlinear shell theory are, by applying the Papkovich-Galerkin method, reduced to nonlinear ordinary differential equations and solved on continuously-acting analog computers (the MN-7 computer was used). (Author)

AD-296 208 Div. 25, 9
(TISTP/JW) OTS price $5.60

Naval Ordnance Lab., White Oak, Md.
THE DETERMINATION OF CRITICAL ROUGHNESS HEIGHT FOR BOUNDARY LAYER TRANSITION,
by W. C. Lyons, Jr. and Z. J. Levensteins. Dec 62, 50p. incl. illus. 11 refs. (Rept. no. NOLTR 61-87; Ballistics Research rept. no. 49)
Unclassified report

DESCRIPTORS: *Boundary layer, *Heat transfer, Compressible flow, Pressure, Height finding, Fluid flow.

AD-296 210 Div. 25
(TISTP/WH) OTS price $4.60

Research Lab. of Electronics, Mass. Inst. of Tech., Cambridge.
PERTURBATION OF A PLASMA BY A PROBE,
by John F. Waymouth. 26 Dec 62, 43p. incl. illus. table, 14 refs. (Technical rept. no. 406)
(Contract DA 36-039-sc-78108, Proj. 3-99-25-001-08)
Unclassified report

DESCRIPTORS: *Plasma physics, *Electric discharges, *Magnetic fields, *Plasma sheath, Ions, Electrons, Instrumentation, Interference, Electric arcs, Electrodes.

The perturbation of the plasma by a probe is analyzed as a problem in ambipolar diffusion, subject to the assumptions that the mean-free path of plasma particles is: (1) comparable to or smaller than probe dimensions, and (2) much greater than the thickness of any sheath that may be present. Sheaths must therefore be assumed to be thin in comparison with probe dimensions. Analyses are carried through for spherical probes and for plane probes oriented normal to a magnetic field. The results can be expressed in terms of a parameter Q which is approximately equal at zero sheath potential to the sum of the ratios of probe size to electron mean-free path and probe size to ion mean-free path. Since Q also depends on sheath potential, the current-voltage characteristics are distorted. (Author)

AD-296 211 Div. 25, 9
(TISTP/WH) OTS price $5.60

Research Lab. of Electronics, Mass. Inst. of Tech., Cambridge.
THE EFFECT OF CLOSE COLLISIONS ON THE TWO-BODY DISTRIBUTION FUNCTION IN A PLASMA.
Doctoral thesis,
by David Ellis Baldwin. 31 Dec 62, 57p. 16 refs. (Technical rept. no. 402)
(Contract DA 36-039-sc-78108, Proj. 3-99-25-001-08)
Unclassified report

DESCRIPTORS: *Plasma physics, *Scattering, *Diffusion, *Transport properties, Integration, Partial differential equations, Special functions (Mathematics), Electric fields, Kinetic theory, Particles, Mathematical analysis.

The development of a two-body distribution function in a plasma for use in a kinetic equation for the one-body distribution function is investigated. The kinetic equation is obtained for a uniform plasma for those circumstances in which the time dependence of higher-order distribution functions can be assumed to occur within a functional dependence on the one-particle distribution function. The conditions of validity for this functional-dependence assumption are discussed. (Author)

AD-296 233 Div. 25, 8
(TISTP/WH) OTS price $8.10

Texas Instruments, Inc., Dallas.
BASIC RESEARCH IN THERMIONICS. PART I. CESIUM PERMEATION THROUGH TANTALUM.
Summary rept. no. 1, 1 Nov 61-31 Oct 62,
by R. A. Chapman, D. A. Peterman and others.
Jan 63, 73p. incl. illus. tables, 28 refs.
(Contract Nonr-370500, Proj. 099-364)
Unclassified report

DESCRIPTORS: *Thermionic emission, *Tantalum, *Cesium, *Plasma physics, *Diffusion, Diodes, Crystals, Ions, Space charges, Metallic crystals.

A plasma thermionic converter concept has been proposed which uses cesium permeation through a tantalum emitter to obtain space charge neutralization of electron current from this emitter. The objective of this project was to determine if the permeation rate of cesium through tantalum was sufficiently large for feasibility of the concept. It has been shown that the concept is not feasible because the permeation rate of Cs through tantalum is too small. Cesium permeation through tantalum has been studied in the temperature range 1400 to 1800 C with cesium pressures up to 13 mm Hg. This phenomenon was investigated for potential application as a hollow, ion-dispensing emitter for a plasma thermionic converter. Three methods were used in this study: (1) measurement of ion current from a hollow, polycrystalline tantalum emitter internally connected to a cesium reservoir, (2) measurement of weight-loss from a hollow, polycrystalline tantalum container with a cesium reservoir attached, with both suspended from a microbalance into a radiant furnace, and (3) direct measurement of the diffusion coefficient in single-crystal and polycrystalline tantalum utilizing radioactive Cs-134. (Author)

AD-296 287 Div. 25
(TISTP/JW) OTS price $1.60

Electron Tube and Microwave Lab., Calif. Inst. of Tech., Pasadena.
THE LOW DENSITY PLASMA SHEATH IN CYLINDRICAL GEOMETRY,
by Jerald V. Parker. Dec 62, 13p. incl. illus. tables, 2 refs. (Technical rept. no. 19)
(Contract Nonr-22013)
Unclassified report

DESCRIPTORS: *Plasma sheath, *Cylindrical bodies, Electron density, Partial differential equations, Density, Geometry.

AD-296 302 Div. 25
(TISTP/JBM) OTS price $1.60

Naval Ordnance Test Station, China Lake, Calif.
AN EXPERIMENT IN THE SPECIAL THEORY OF RELATIVITY,
by Gary C. Babcock. Dec 62, 14p. incl. illus. 14 refs. (NOTS TP 3053)
(NAVWEPS rept. no. 8051)
Unclassified report

DESCRIPTORS: *Relativity theory, *Light, Interferometers, Experimental data, Glass, Beams (Electromagnetic), Optical phenomena, Electromagnetic waves, Optics, Velocity.

An experiment was conducted to test the special theory of relativity as opposed to the new-source interpretation of the emission theory. The apparatus used consisted of an interferometer whose beams went through moving pieces of glass; the hypothesis being that if the velocity of light took on any of the velocity of the moving glass, then the interference fringes would shift; but if the speed of light were a constant, as the special theory of relativity predicts, no fringe shift would occur. (The pieces of glass were not thick enough to require consideration of the Fresnel dragging coefficient). It was concluded that the results of the experiment favor relativity. (Author)

AD-296 312 Div. 25, 8
(TISTM/ODN) OTS price $4.60

Philco Corp., Blue Bell, Pa.
THIN FILM ACTIVE DEVICES.
Quarterly rept. no. 1, 22 June-22 Sep 62,
by James P. Spratt. 22 Oct 62, 42p. incl. illus. tables, 22 refs.
(Contract DA 49-186-ORD-1056)
Unclassified report

DESCRIPTORS: *Thin films (Storage devices), Electrons, Theory, Electric potential, Triodes, Field emission, Semiconductors, Germanium, Electric currents, Probability, Aluminum, Oxidation, Oxides, Metal films.

The problem of collecting hot electrons from a metal by means of a simple metal-insulator interface is discussed. Backscattering out of the insulator is shown to be a serious problem if high collection efficiencies are desired. Fabrication of tunnel emitters for the Metal Edge Amplifier (MEA) was seriously hindered by shorting through the natural oxide of aluminum. A more fundamental examination of the oxidation process was begun and, in the meantime, attempts will be made to use evaporated insulators for device fabrication. (Author)

AD-296 319 Div. 25
(TISTA/GEC) OTS price $2.60

Rome Air Development Center, Griffiss Air Force Base, N. Y.
LOW FREQUENCY BREAKDOWN IN DIELECTRIC GASES,
by Vincent C. Vannicola. Dec 62, 19p. incl. illus. tables, 4 refs. (Rept. no. RADC TDR 62-585)
(Proj. 4506)
Unclassified report

DESCRIPTORS: *Gases, Sulfur compounds, Fluorides, Carbon compounds, Spark plugs, Decomposition, Electric arcs, Dielectrics, Electric potential, Chlorides, Dielectric properties.

Experiments were conducted on the breakdown strength of several dielectric gases at 60 cps

in the region of a spark plug gap. Breakdown power of sulfur-hexafluoride (SF_6) was 20% greater when the electrodes were degassed at 50 microns compared to 1000 microns. As the concentration of SF_6 was decreased from 98% to 50%, only a small decrease in breakdown strength was noted. It is estimated that this factor can be used to reduce leakage of SF_6 by approximately 50%. The degradation effects of prolonged arcing were measured on breakdown onset voltage, extinguish voltage, and chemical decomposition. Gases analyzed, listed in their order of decreasing dielectric strength, include C_4F_8, Freon 115, SF_6, C_3F_8, Freon 116, and air. (Author)

AD-296 390 Div. 25
(TISTP/JW) OTS price $4.60

Electronics Research Lab., U. of Calif., Berkeley.
PLASMA OSCILLATIONS AND PARTICLE TRAJECTORIES IN A DRIFTING ELECTRON STREAM; PALMER DIAGRAMS,
by C. K. Birdsall. 29 June 62, 44p. incl. illus. refs. (Series no. 60, Issue no. 458)
(Contract AF 49(638)102)
Unclassified report

DESCRIPTORS: *Space charges, *Plasma oscillation, Hydrodynamics, Electron beams, Special functions, Velocity, Frequency, Electromagnetic waves, Electrons, Particles.

Electron trajectories are obtained for the Hahn-Ramo space-charge waves. The approach is to use Lagrangian form of hydrodynamic equations of motion and of continuity. This is in contrast with the more common Eulerian jellied-out fluid approach where the particle identity is lost. The model used is developed in some detail. Trajectory plots are given for the faster and slower space-charge waves by themselves and for velocity modulation for the ratios of driving frequency to selected plasma frequencies. (Author)

AD-296 395 Div. 25, 2
(TISTP/JW) OTS price $1.60

Army Electronics Research and Development Lab., Fort Monmouth, N. J.
ANALYSIS OF THE ELECTROSTATIC FIELD OF A LIGHTNING STROKE,
by H. W. Kasemir. Nov 62, 19p. incl. illus. table, 6 refs. (AELRDL Technical rept. no. 2321)
Unclassified report

DESCRIPTORS: *Electrostatic fields, *Lightning, Electric fields, Storms, Analysis, Frequency.

During the summer of 1961 the electrostatic field of lightning strokes in the frequency range from 0 to 100 cps was recorded. Simultaneously, the distance from the lightning stroke to the recording station was determined by triangulation. This, combined with the electrostatic theory, allows a detailed analysis of the electric field of the lightning stroke. The results of this analysis are discussed. (Author)

AD-296 398 Div. 25, 4, 30
(TISTM/EJH) OTS price $6.60

AeroChem Research Labs., Inc., Princeton, N. J.
CHEMICAL SCAVENGER PROBE DETERMINATIONS OF ATOM AND EXCITED MOLECULE CONCENTRATIONS IN NONEQUILIBRIUM SUPERSONIC STREAMS OF ACTIVE NITROGEN,
by A. Fontijn, D. E. Rosner, and S. C. Kurzius. Aug 62, 49p. incl. illus. tables, 100 refs. (Rept. no. TP-40)
(Contract AF 49(638)300)
Unclassified report

DESCRIPTORS: *Gas discharges, *Glow discharges, *Nitrogen, *Chemical analysis, Supersonic nozzles, Gases, Nitrogen compounds, Oxides, Hydrogen compounds, Ethenes, Chemical reactions, Atoms, Molecules, Supersonic flow, Excitation, Quartz, Quantitative analysis, Laboratory equipment, Plasma jets.

A quartz chemical scavenger probe was developed to study local active species concentrations in a gas expanded from a converging-diverging nozzle glow discharge source. The probe samples a small central portion of the supersonic non-equilibrium jet. Results obtained with active N at one relatively low discharge power output are discussed. The sampled gas mixed and reacted inside the probe with one of the scavenger gases NO, NH_3 or C_2H_4 at 18.8 mm Hg and an average temperature of 500 K. The NO light titration technique and the production of HCN from C_2H_4 set an upper and lower bound respectively for the atom concentration. The observed maximum amount of NO decomposition was 2.1 times as large as the NO light titration end point flow rate. This difference is far in excess of that observed in conventional discharge flow systems and is interpreted as being due to excited N_2 molecules reacting with NO in a reaction slow compared to that between N-atoms and NO. The contribution of these molecules to the energy content of the jet was found to be at least comparable to that of the N-atoms. A new analytical technique for quantitative analysis of the undecomposed NO was developed. Decomposition of NH_3 also showed the presence of excited molecules. The NO light titration technique can also be used for composition measurements of the total supersonic jet. (Author)

AD-296 404 Div. 25, 30, 15
(TISTA/FRL) OTS price $4.60

Institute of Optics, U. of Rochester, N. Y.
RESEARCH ON FUNDAMENTALS OF GEOMETRICAL OPTICS. Final rept.,
by Robert E. Hopkins. 31 Oct 62, 1v. incl. illus. tables, refs.
(Contract AF 49(638)668, Proj. 976)
Unclassified report

DESCRIPTORS: *Optics, *Lenses, Differential equations, Design, Geometry, Optical analysis, Optical images, Scientific research, Programming (Computers), Computers, Corrections.

A set of programs are prepared to carry out many of the requirements for automatic lens design on a data processing machine. This set of programs is called ORDEALS. The ORDEALS programs are described as follows: optics programs for the computer, a general linearization method for automatic lens correction, and an introduction to the geometric optical frequency response. (Author)

AD-296 409 Div. 25, 27
(TISTM/SJN) OTS price $1.10

Pennsylvania State U., University Park.
COMPUTATION OF KINETIC CONSTANTS FROM SINGLE-PULSE SHOCK TUBE DATA,
by Bruce E. Knox, Edward T. McHale and Howard B. Palmer. Jan 63, 9p. incl. illus. 6 refs. (Proj. Squid technical rept. no. PSU-9-P)
(In cooperation with Virginia U., Charlottesville)
Contract Nonr-362300, Proj. NR 098-038)
Unclassified report

DESCRIPTORS: *Dynamics, *Reaction kinetics, Shock tubes, Shock waves, Adiabatic gas flow, Heat of activation, Jet propulsion, Jet engine fuels.

Single-pulse ('chemical') shock tube experiments, as normally performed (1,2), yield information on the incident shock velocity, the pressure-time profile of the gas near the end of the tube, and the composition of the product mixture. The results are most reliable when the attenuation of the incident shock is measured, in order to compute the velocity at the moment of shock reflection, and when sampling of products is restricted to gas that was close to the end plate during the reflected shock. One can then confidently compute the conditions within this sample at the moment when it entered the reflected shock. (Author)

AD-296 413 Div. 25
(TISTM/SJR) OTS price $2.60

Institute of Tech., U. of Minn., Minneapolis.
ON THE ZENER EFFECT IN ALLOYS I. THE SIZE FACTOR,
by J. M. Sivertsen. 15 Sep 62, 20p. incl. illus. 9 refs. (Technical rept. no. 6)
(Contract Nonr-71029)
Unclassified report

DESCRIPTORS: *Alloys, *Thermodynamics, *Crystal structure, *Symmetry (Crystallography), *Excitation, *Algebra, *Stresses, Differential equations, Tensor analysis, Vector analysis, Relaxation time, Thermal conductivity, Crystal lattice defects, Anisotropy (Crystallography), Atomic energy levels, Shear stresses.

The problem of the stress-induced ordering of solute atoms, the so-called Zener effect, is considered. In this work the effect of the difference in solute-solvent atom sizes is considered. Starting with this size factor the tensor anelastic strain is computed. Then by the thermodynamic theory for relaxation processes, due Meixner and others, the relaxation strength, is calculated as a function of orientation. The results of the calculation suggest that the size factor is not necessarily the most important contribution in determining the relaxation strength. It is suggested that electronic effects may be more significant. (Author)

AD-296 430 Div. 25, 7
(TISTP/JB) OTS price $14.50

Space Sciences Lab., General Electric Co., Philadelphia, Pa.
THE THEORY OF MAGNETOHYDRODYNAMIC POWER GENERATORS,
by G. W. Sutton. Dec 62, 205p. incl. illus. 51 refs. (Rept. no. R62SD990)
(Contract AF 49(638)914)
Unclassified report

DESCRIPTORS: *Magnetohydrodynamics, Electric power production, Gas ionization, Electrical conductance, Vortex generators, Electrodes, Magnetic fields, Compressible flow, Magneto-optic effect, Electric currents, Atoms, Molecules, Elasticity, Electrons, Alternating current, Theory, Molecular weight, Ionization potentials, Generators.

The theory of magnetohydrodynamic power generators is presented. The topics covered are: electrical conductivity in MHD generators, optimum ''seed'' ratio, local analyses of the continuous and segmented electrode geometries; Hall geometry, helical flow geometry; magnetically induced ionization; polytropic efficiencies; compressible analyses of the constant velocity, temperature, Mach number, pressure and cross-sectional area flows; end losses; AC generation; cycle efficiencies; and a summary of experiments. Geometries other than linear are not considered herein; the most important of those omitted is the vortex generator. (Author)

AD-296 433 Div. 25
(TISTP/TL) OTS price $2.60

Lexington Labs., Inc., Cambridge, Mass.
INVESTIGATION OF HIGH TEMPERATURE THERMAL EXPANSION DEVICES AND DESIGN OF A UNIT FOR USE WITH THERMAL IMAGE HEATING.
Final rept.,
by Robert C. Folweiler. 15 Dec 62, 21p. incl. illus. 5 refs.
(Contract AF 19(628)1616, Proj. 5634)
(AFCRL 62-952) Unclassified report

DESCRIPTORS: *High temperature research, *Infrared images, *Solar furnaces, Thermal expansion, Optics, Atmosphere, Thermocouples, Heat transfer, Xenon lamps, Control, Measurement, Thermal radiation, Design.

AD-296 439 Div. 25, 30
(TISTM/EJH) OTS price $1.60

Lincoln Lab., Mass Inst. of Tech., Lexington.
AN INTERFERENCE MICROSCOPE STUDY OF IRON WHISKERS.
by T. P. Turnbull and M. J. Button. 1962, 7p. illus. 2 refs.
Unclassified report

Presented at the International Microscopy Symposium, 13 June 62, Chicago.

DESCRIPTORS: *Crystal growth, *Crystals, Single crystals, Iron, Interference, Microscopy, Nucleation.

Interference microscopy has proven to be an invaluable technique for the observation of nucleation habits and branching phenomena of iron whiskers. A Zeiss interference microscope was employed in an investigation having as its threefold objective: (1) the study of crystal growth preceding nucleation sites on existing whiskers; (2) determine whether branching whiskers as well as new growth directions maintain the same crystallographic continuity; and, (3) develop a visual technique of ascertaining the degree of perfection of the crystal faces. The whiskers studied ranged in length from a few mm to 2 cm. It is possible to determine variations in surface topography from 0.03 to 2 microns. Use of the illumination provided by the interference fringes in the study of metallic whiskers made it possible to achieve the threefold objective. The micrographs presented demonstrate the usefulness of the interference microscope as another technique in determining crystal perfection by a visual method. (Author)

AD-296 440 Div. 25
(TISTM/EJH) OTS price $3.60

General Electric Co., Syracuse, N. Y.
PHONON-PHONON INTERACTION IN CRYSTALS.
Quarterly progress rept. no. 6, 1 Sep-30 Nov 62. 30 Nov 62, 43p. incl. illus.
(Contract DA 36-039-sc-87209)
Unclassified report

DESCRIPTORS: *Solid state physics, *Phonons, *Single crystals, Crystals, Crystal lattices, Quartz, Germanium, Silicon, Cadmium compounds, Sulfides, Tellurides, Piezoelectric crystals, Magnetostrictive elements, Electromagnets, Excitation, Microwaves, Propagation.

The generation, propagation and interaction of phonons are studied with emphasis on the phonon interactions in crystals. Theoretical curves based on the selection rules have been drawn for the various modes of operation for phonon-phonon interaction in solids. They are analyzed with regard to the various types of parametric interactions that are possible. Experimental results and observations are discussed pertaining to phonon generation and attenuation in various types of single crystals. Experimental studies involving the search for phonon interactions are reported. (Author)

AD-296 452 Div. 25, 9
(TISTP/JW) OTS price $3.60

Electronics Research Lab., U. of Calif., Berkeley.
WAVES IN DRIFTING AND ACCELERATING ELECTRON STREAMS IN RADIAL FLOW,
by W. B. Bridges and C. K. Birdsall. 29 June 62, 19p. incl. illus. 10 refs. (Series no. 60, Issue no. 459)
(Contract AF 49(638)102)
Unclassified report

DESCRIPTORS: *Fluid flow, *Drift, Linear systems, Motion, Hydrodynamics, Equations, Velocity, Klystrons, Electromagnetic waves, Acceleration.

AD-296 454 Div. 25, 6
(TISTM/EJH) OTS price $1.60

Santa Barbara Research Center, Goleta, Calif.
PHYSICAL PROPERTIES OF LEAD SELENIDE FILMS.
Quarterly rept. no. 2, 27 Sep-27 Dec 62,
by D. E. Bode and R. M. Talley. 10 Feb 63, 18p. incl. illus. 3 refs. (Rept. no. R3220-Q-2)
(Contract NOw-62-0925-c)
Unclassified report

DESCRIPTORS: *Infrared detectors, *Lead compounds, *Selenides, Intermetallic compounds, Lead alloys, Selenium alloys, Films, Resistance (Electrical), Electrical properties, Temperature, Hall effect, Radiation damage, Photoelectric materials.

AD-296 457 Div. 25, 15
(TISTM/SJR) OTS price $2.60

Bausch and Lomb, Inc., Rochester, N. Y.
INFRARED COATING STUDIES.
Quarterly rept. no. 3, 15 Aug-15 Nov 62,
by F. Sulzbach and A. Francis Turner. 15 Nov 62, 8p. illus.
(Contract DA 44-009-eng-4954, Proj. 8F23-11-001-05)
Unclassified report

DESCRIPTORS: *Infrared films, *Thin films, Crystal structure, X-ray diffraction analysis, Lithium compounds, Fluorides, Reflection, Nickel compounds, Sulfates, Postassium compounds, Phosphates, Aluminum compounds, Sodium compounds, Tin compounds, Oxides, Silicates, Calcium compounds, Iron compounds, Quartz, Bismuth compounds, Selenides, Molybdenum compounds, Silicides, Glass, Germanium, Coatings, Crystals.

AD-296 491 Div. 25
(TISTP/TL) OTS price $12.00

Lincoln Lab., Mass. Inst. of Tech., Lexington.
DISTORTIONS AND STRESSES OF PARABOLOIDAL SURFACE STRUCTURES. PART II. THE MEMBRANE BEHAVIOR,
by James W. Mar and Frederic Y. M. Wan.
4 Jan 63, 166p. incl. illus. tables, 21 refs. (Rept. no. 776-1)
(Contract AF 19(628)500)
(AFCSD TDR 63-17) Unclassified report

DESCRIPTORS: *Structural shells, Vector analysis, Shear stresses, Loading (Mechanics), Deformation, Gravity, Differential equations, Elasticity, Tables, Stresses.

The paraboloidal shell will, under the proper circumstances, prefer to carry the applied loads by the development of the force resultants $N_{\alpha\beta}$ rather than by the development of the transverse shear resultants Q_{α} and the bending moment resultants, $M_{\alpha\beta}$. Such behavior is commonly called membrane behavior although the term ''Momentless'' behavior is the more connotative. The membrane or momentless behavior will be the dominant mode of behavior when either the bending moments induced by the loads are negligibly small or whenever the flexural (bending) rigidity of the shell is sufficiently small so that the shell will deform without inducing appreciable bending moments. In this chapter, various solutions of the membrane equations as written in terms of the polar parameters will be presented. The so-called membrane equations are easily obtained by omitting the $M_{\alpha\beta}$, Q_{α}, and $k_{\alpha\beta}$ terms from the equations which have been derived in the previous sections. (Author)

AD-296 500 Div. 25, 9, 15
(TISTA/FRL) OTS price $8.60

Aerospace Corp., Los Angeles, Calif.
THE DYNAMIC STABILITY OF ELASTIC SYSTEMS. VOLUME II,
by V. V. Bolotin, tr. by V. I. Weingarten and others. 10 Dec 62, 86p. incl. illus. 100 refs. (Rept. no. TDR-169(3560-30)TR-2, vol. 2)
(Contract AF 04(695)169)
(SSD TDR 62-154, vol. 2)
Unclassified report

DESCRIPTORS: *Dynamics, Oscillation, Vibration, Linear systems, Deflection, Elasticity, Integral equations, Damping, Nonlinear systems, Resonance, Bibliographies, Stability.

AD-296 507 Div. 25, 30
(TISTP/TL) OTS price $6.60

Corning Glass Works, Bradford, Pa.
MULTIPLE TAPPED PHOTOELASTIC DELAY LINE.
Final rept., 1 June 61-1 June 62 on Phase 1,
by I. C. Miller, A. J. Polucci and G. J. Pratt.
2 Jan 63, 61p. incl. illus. tables, 5 refs.
(Contract AF 30(602)2060, Proj. 4506)
(RADC TDR 62-324) Unclassified report

DESCRIPTORS: *Delay lines, Ultrasonic properties, Optics, Sound signals, Signal-to-noise ratio, Photomultipliers, Optical equipment, Phototubes, Video amplifier, Polarization, Collimators, Glass, Fiber optics, Light transmission, Detection, Photoelasticity.

An optical technique for detecting an acoustic signal in a glass ultrasonic delay line is described. A useful model with a system bandwidth of 10 mc centered at 15 mc, a signal-to-noise ratio exceeding 20 db and five independent

outputs separated one from another by 0.1 usec was constructed and is described herein. Using a model with these characteristics, it is possible to determine both the advantages and the feasibility of ultimately producing a multiple tapped delay line with as many as 1000 taps. (Author)

AD-296 525 Div. 25, 15
(TISTP/WH) OTS price $4.60

Aerospace Corp., Los Angeles, Calif.
THE GOVERNING MACROSCOPIC EQUATIONS OF PARTIALLY IONIZED GASES,
by D. M. Dix. 25 July 62, 41p. 8 refs. (Rept. no. TDR-69(2230-04)TN-2)
(Contract AF 04(695)69)
(DCAS TDR 62-133) Unclassified report

DESCRIPTORS: *Gas ionization, *Plasma physics, *Transport properties, *Diffusion, Particles, Equations, Mathematics, Ions.

Useful formulations of the macroscopic conservation relations for a three-component mixture composed of ions, electrons, and neutral particles are developed from the basic forms of the equations for the individual species. The development represents primarily an orderly compilation of the work of previous investigators, although the equations developed are somewhat more general than those previously derived. In particular, all inertial and viscous terms are retained, and the temperatures of the individual species are not required to be equal. In addition, treatment of the energy equations is included. (Author)

AD-296 526 Div. 25
(TISTP/WH) OTS price $2.60

Aerospace Corp., Los Angeles, Calif.
EXPERIMENTAL MAGNETOHYDRODYNAMIC TURBULENCE INVESTIGATIONS,
by E. B. Turner. 16 Aug 62, 21p. incl. illus. 4 refs. (Rept. no. TDR-69(2230-14)TR-1)
(Contract AF 04(695)69)
(DCAS TDR 62-167) Unclassified report

DESCRIPTORS: *Magnetohydrodynamics, *Magnetic pinch, *Instrumentation, Turbulence, Stability, Kerr cells.

Previous investigations of MHD turbulence are reviewed briefly, and a short description of the apparatus, a stabilized linear pinch device, is presented. Improvements in the frequency response of the magnetic probes and RC integrators and modifications to the design of the high-pass filters are discussed. The following experimental results obtained during the recent six-month period are presented: (1) autocorrelation measurements have been performed on a set of Kerr cell photographs of the pinch to determine the wavelength of the instabilities, (2) promising results have been obtained using an x-y oscilloscope to determine the degree of correlation between signals from magnetic probes separated by varying distances, (3) Alfven wave propagation of the magnetic field fluctuations was observed by the phase shift between two probe signals, (4) some analyses have been made of the rms values of B and its first and 2nd derivatives to t, and the maximum frequency of the turbulence has been determined, and (5) high-quality Kerr cell photographs of the pinch have been taken on color film, using a new Kerr cell with a fluid which transmits the entire visible spectrum. The need for automatic data reduction techniques and for digital computer processing of data is also discussed. (Author)

AD-296 568 Div. 25
(TISTP/WH) OTS price $3.60

Pennsylvania U., Philadelphia.
GREEN FUNCTION THEORY OF FERROMAGNETISM,
by Herbert B. Callen. Nov 62, 32p. incl. table, 11 refs. (Technical rept. no. 4)
(Contract Nonr-55136)
Unclassified report

DESCRIPTORS: *Ferromagnetism, *Green's function, *Nuclear spins, Mathematical analysis, Magnetism, Crystals.

A theory of ferromagnetism for general spin, approximately valid through the entire temperature range, is given. (Author)

AD-296 750 Div. 25
(TISTP/JW) OTS price $4.60

Navy Electronics Lab., San Diego, Calif.
OPTICAL PROPERTIES OF THE BERING SEA NAVAL ENVIRONMENT JANUARY-FEBRUARY 1960,
by J. M. Hood, Jr. 18 Dec 62, 41p. incl. illus. tables, 10 refs. (NEL rept. no. 1150)
Unclassified report

DESCRIPTORS: *Optical properties, *Photographic reconnaissance, Visibility, Meteorological parameters, Target recognition, Polar regions, Naval operations.

AD-296 755 Div. 25, 9, 12
(TISTA/FRL) OTS price $2.60

Aerospace Corp., Los Angeles, Calif.
BUCKLING OF A TRUNCATED HEMISPHERE UNDER AXIAL TENSION,
by John C. Yao. 12 Nov 62, 20p. incl. illus. 3 refs. (Rept. no. TDR-169(3560-30)TN-2)
(Contract AF 04(695)169)
(SSD TDR 62-189) Unclassified report

DESCRIPTORS: *Hemispherical shells, Tensile properties, Theory, Geometry, Differential equations, Integral equations, Deflection, Deformation.

This report is concerned with the theoretical evaluation of the buckling strength of a truncated hemisphere under axial tensile load. The edges of the shell are assumed to be restrained from moving radially or from rotating. Theoretical results were obtained by Vlasov's small deflection theory and Galerkin's method. The quick convergence of the series solution is demonstrated. Comparison of theoretical values with a few available experimental results is given. (Author)

AD-296 756 Div. 25, 9
(TISTP/WH) OTS price $1.60

Aerospace Corp., Los Angeles, Calif.
AN APPROXIMATE ANALYSIS OF SIMULTANEOUS GAS-PHASE AND SURFACE ATOM RECOMBINATION FOR STAGNATION BOUNDARY LAYER,
by P. M. Chung and S. W. Liu. 26 Nov 62, 13p. incl. illus. 10 refs. (Rept. no. TDR-169(3230-12)TN-4)
(Contract AF 04(695)69)
(SSD TDR 62-194) Unclassified report

DESCRIPTORS: *Blunt bodies, *Heat transfer, *Boundary layer, *Gas flow, *Atoms, *Surfaces, Reentry vehicles, Chemical reactions, Recombination reactions, Solids.

The concept of equivalent surface reaction is developed for gas-phase recombination at the stagnation region of blunt bodies. This concept is based on the fact that the chemical

state of a nonequilibrium highly cooled boundary layer largely determined by the recombination that occurs near the wall. An equation based on this concept is shown to predict the heat transfer to a noncatalytic surface to within a few percent of the more accurate existing results. The equation is generalized to apply to the case in which surface catalytic recombination occurs simultaneously with gas-phase reaction. (Author)

AD-296 761 Div. 25
(TISTM/ODN) OTS price $1.60

Alloyd Corp., Cambridge, Mass.
A FUNDAMENTAL STUDY OF ROLLING CONTACT FATIGUE.
Quarterly progress rept. no. 7, 1 Nov 62-1 Feb 63,
by M. J. Hordon and P. F. Weihrauch. 1 Feb 63, 10p. incl. illus.
(Contract NOw61-0656-c)
Unclassified report

DESCRIPTORS: *Steel, Stresses, Fluids, Design, Preparation, Deformation, Test equipment, Antifriction bearings, Theory, Fatigue (Mechanics).

Design data and experimental results have evolved an experimental approach for the investigation of torsional fatigue in fluid environments. Preliminary results of fatigue life of AISI E52100 steel in different fluid environments are presented. (Author)

AD-296 763 Div. 25, 20
(TISTP/TL) OTS price $5.60

Uppsala U. (Sweden).
APPLICATIONS OF LOCALIZED PERTURBATION TECHNIQUE,
by M. Asgar Ali and Richard F. Wood. 1 Apr 62, 56p. incl. illus. tables, refs. (Technical note no. TN 75)
(Contract AF 61(052)351)
(ARL 63-27) Unclassified report

DESCRIPTORS: *Perturbation theory, *Quantum mechanics, *Matrix algebra, *Electrons, *Chemical bonds, Nuclear resonance, Nuclear spins, Stability, Polynomials, Density, Nuclear energy levels, Functions, Nuclear physics, N-body problems, Integrals, Atomic orbitals, Molecules.

AD-296 764 Div. 25
(TISTP/TL) OTS price $1.10

Athens U. (Greece).
MOMENTUM OF ELECTRONS IN SOLIDS.
Annual technical rept., 1 Sep 61-31 Aug 62,
by K. Alexopoulos. 31 Aug 62, 6p. incl. illus.
(Contract DA 91-591 EUC-1859)
Unclassified report

DESCRIPTORS: *Electrons, *Solids, Metals, Motion, Monochromatic light, Photons, Crystal structure, Spectrum analyzers, Velocity, Compton scattering.

AD-296 782 Div. 25
(TISTP/JW) OTS price $1.60

Army Electronics Research and Development Lab., Fort Monmouth, N.J.
INFLUENCE OF A D.C. AND A.C. MAGNETIC FIELD UPON A GAS DISCHARGE LASER,
by Rudolf G. Buser, Johann J. Kainz and John J. Sullivan. Dec 62, 22p. incl. illus. 10 refs. (AELRDL technical rept. no. 2322)
Unclassified report

DESCRIPTORS: *Lasers, *Magnetic fields, Energy, Distribution, Light transmission, Electrons, Gas discharges, Emissivity.

The influence of a magnetic field upon a gas discharge laser has been investigated. The magnetic field changes the spatial and energy distribution of the electrons and therefore influences the light output of the laser. Experiments show that this effect may be useful for adjustment and modulation of the laser emission. (Author)

AD-296 785 Div. 25
(TISTP/JW) OTS price $11.00

Hughes Research Labs., Malibu, Calif.
RESEARCH ON COHERENT GENERATION OF OPTICAL RADIATION.
Final rept., 1 May 61-31 Aug 62,
by G. F. Smith. Oct 62, 133p. incl. illus. tables, 38 refs.
(Contract AF 33(616)8233, Proj. 5237)
(ASD TDR 62-938) Unclassified report

DESCRIPTORS: *Solid state physics, *Optics, *Generators, Lasers, Ruby, Resonators, Excitation, Instrumentation, Radiation measurement systems, Power supplies.

AD-296 786 Div. 25, 4
(TISTM/EJH) OTS price $10.10

Carlyle Barton Lab., Johns Hopkins U., Baltimore, Md.
PARAMAGNETIC RELAXATION IN DILUTE POTASSIUM FERRICYANIDE,
by Andreas Rannestad. Dec 62, 124p. incl. illus. tables, 49 refs. (Technical rept. no., AF-99)
(Contract AF 33(616)6753)
Unclassified report

DESCRIPTORS: *Paramagnetic resonance, *Paramagnetic materials, *Iron compounds, *Iron, Complex compounds, Crystals, Ions, Cyanides, Cobalt compounds, Potassium compounds, Relaxation time, Atomic energy levels, Nuclear spins, Crystal lattices, Solutions, Microwave spectroscopy, L band, X band, Theory.

Paramagnetic relaxation times for the ground state Kramers doublet of iron present as a dilute substitutional impurity in potassium cobalticyanide was measured for iron concentrations from 0.24% to 3.5%, over the temperature range 1.25 to 4.5 K. Measurements were performed at 1.8 and 8.5 Gc/s. A review of relevant crystal field theory is given and includes calculation of energy levels for 3 lowest Kramers doublets. Spin-lattice relaxation theory is reviewed and compared with experimental findings. At low iron concentration spin lattice times measured at 1.8 Gc/s are found to display a 9th-power temperature variation over 5 decades of time, in agreement with the theory of the Raman process. No change in the Raman rate is observed between 1.8 and 8.5 Gc/s. At 8.5 Gc/s the linear temperature dependence for the direct relaxation process is also verified. At higher concentrations, added relaxation mechanisms appear. At highest concentrations a competing fast process is also observed, but is not fully understood. (Author)

AD-296 788 Div. 25
(TISTP/JW) OTS price $3.60

Lincoln Lab., Mass. Inst. of Tech., Lexington.
MAGNETIC PROPERTIES OF A SINGLE CRYSTAL OF

Division 25 - PHYSICS

MANGANESE PHOSPHIDE,
by E. E. Huber, Jr. 18 Dec 62, 32p. incl. illus. tables, 57 refs. (Technical rept. no. 280)
(Contract AF 19(628)500)
(AFESD TDR 62-276) Unclassified report

DESCRIPTORS: *Single crystals, *Manganese compounds, Temperature control, Ferromagnetism, Measurement, Spin, Temperature coefficient of reactivity, Magnetic properties, Phosphides.

Magnetic measurements were made on a spherical single crystal of high-purity stoichiometric MnP with a vibrating sample magnetometer which was modified to allow precise temperature control and temperature cycling from 4 to 500 K. Anisotropy, saturation magnetization, and susceptibility data were obtained over this temperature range. Evidence is presented which shows that MnP is neither ferrimagnetic nor antiferromagnetic with weak superimposed ferromagnetism, as has been previously supposed. Strong ferromagnetic coupling between spins may be assumed from the fact that the 1/X vs T curve has strong concave-up curvature above the Curie point. A magnetic transformation, not previously reported, was observed at 50 K which may be interpreted in terms of temperature-dependent, competing antiferromagnetic-ferromagnetic interactions. Below 50 K, MnP is metamagnetic, i.e., it exhibits an antiferromagnetic-ferromagnetic transition which is a function of applied field and temperature. (Author)

AD-296 839 Div. 25, 9
(TISTP/JW) OTS price $10.10

Technical Research Group, Syosset, N. Y.
MICROWAVE AMPLIFICATION BY RESONANCE SATURATION. Final rept.,
by Benjamin Senitzky and Gordon Gould. Nov 62, 121p. incl. illus. tables.
(Contract AF 30(602)2033, Proj. 128)
(RADC TDR 62-577) Unclassified report

DESCRIPTORS: *Microwave amplifiers, Amplitude modulation, Nonlinear systems, Traveling-wave tubes, Resonance absorption.

A new amplification principle is introduced based on nonlinear response of a saturated resonance absorption. The amplification and bandwidth of a traveling wave device based on this principle is derived. Experimental results on amplification obtained with iron-doped rutile as the active medium at 81.3 kMc are found to be in agreement with theory. (Author)

AD-296 875 Div. 25, 8
(TISTP/JW) OTS price $8.10

Electronics Research Lab., U. of Calif., Berkeley.
THREE-LEVEL MASER MATERIALS: A SURVEY OF POTENTIAL MATERIALS, I,
by J. Wakabayashi. 7 Mar 62, 77p. incl. illus. table, 80 refs. (Series no. 60, Issue no. 439)
(Contract AF 49(638)102)
Unclassified report

DESCRIPTORS: *Masers, Oscillators, Magnetic fields, Electromagnetic fields, Materials, Energy, Quantum mechanics, Production.

AD-296 902 Div. 25
(TISTP/JW) OTS price $13.50

Michigan U. Coll. of Engineering, Ann Arbor.,
MICROWAVE INTERACTIONS AT CRYSTAL DEFECT CENTERS. Final rept.,
by Robert Borcherts, Hossein Azarbayejani and others. Jan 63, 196p. incl. illus. tables, refs.
(Rept. no. 04275-2-F)
(Contract AF 49(638)987)
Unclassified report

DESCRIPTORS: *Crystal structure, *Microwaves, Ruby, Sapphires, Masers, Transformations, Solids, Impurities, Solid state physics.

AD-296 931 Div. 25, 8
(TISTP/WH) OTS price $2.60

RAND Corp., Santa Monica, Calif.
INCOHERENT SCATTERING OF RADIO WAVES BY A PLASMA,
by D. F. DuBois and V. Gilinsky. Jan 63, 19p. incl. illus. 12 refs. (Research memo. no. RM-3440-PR)
(Contract AF 49(638)700, Proj. RAND)
Unclassified report

DESCRIPTORS: *Plasma physics, *Scattering, *Radio waves, Ionosphere, Radiofrequency, Reflection.

The incoherent scattering of radio waves from a hot plasma is computed using the diagrammatic techniques of quantum electrodynamics. This method simplifies previously obtained results and permits extensions to include the effects of close collisions. (Author)

AD-296 946 Div. 25, 9
(TISTA/FRL) OTS price $2.25

Goettingen U. (Germany).
RESEARCH ON SOUND PROPAGATION IN SOUND-ABSORBENT DUCTS WITH SUPERIMPOSED AIR STREAMS. VOLUME I. Final rept. on Biomechanics of Aerospace Operations,
by F. Mechel. Dec 62, 90p. incl. illus. 19 refs.
(Contract AF 61(052)112, Proj. 7231)
(AMRL TDR 62-140, vol. 1) Unclassified report

DESCRIPTORS: *Ducts, Theory, Acoustics, Absorption, Acoustic insulation, Acoustic properties, Coatings, Measurement, Gas flow, Vortices, Attenuation, Boundary layer, Scientific research, Configuration, Acoustic filters, Sound transmission.

The possible effects of flow on airborne sound attenuation in ducts are discussed. The theoretical part results in a simple attenuation formula which considers the following: change of the wavelength due to convection of the sound field, change of the sound pressure at the wall caused by the flow profile, change of the characteristic absorber properties by nonlinear effects, and sound scattering by vortices. With porous absorbers another effect is caused by the different curvature of the phase plane at the boundary of the absorber. Measurements with a porous absorber and with damped Helmholtz resonators show reduction of the attenuation for sound propagation in the direction of the flow and an increase of the attenuation for sound propagation against the flow. With the help of pseudo-sound in flow and of partial waves in ducts with a periodic boundary structure, the sound amplification found in ducts coated with reactive absorbers can be explained by analogy to traveling wave tube amplification phenomena. This analogy was confirmed by measurements on resonant absorbers. (Author)

AD-296 959 Div. 25, 9
(TISTP/MH) OTS price $9.60

Research Lab. of Electronics, Mass. Inst. of Tech., Cambridge.
MAGNETOHYDRODYNAMICS AND ENERGY CONVERSION.
Technical status rept. no. 9 for period ending 30 Nov 62.
15 Dec 62, 20p. incl. illus. 4 refs.
(Contract AF 33(616)7624)
Unclassified report

DESCRIPTORS: *Magnetohydrodynamics, *Energy conversion, *Plasma jets, *Superconductors, *Turbulence, Induction motors, Wave transmission, Tests, Alternating currents, Analysis.

Work was done in following areas: Improving magnetically driven shock tube. Research in magnetohydrodynamic energy conversion, MHD waves, mathematical analysis in continuum MHD, MHD induction generator, AC properties of superconductors, plasma jet experiments, thermal conductivity of cesium vapor, and work function of conductors.

AD-296 984 Div. 25, 9
(TISTA/FRL) OTS price $2.50

Goettingen U. (Germany).
RESEARCH ON SOUND PROPAGATION IN SOUND-ABSORBENT DUCTS WITH SUPERIMPOSED AIR STREAMS. VOLUME III.
Final rept. on Biomechanics of Aerospace Operations,
by F. Mechel, P. Mertens, and W. Schilz. Dec 62, 106p. incl. illus. 7 refs.
(Contract AF 61(052)112, Proj. 7231)
(AMRL TDR 62-140, vol. 3) Unclassified report

DESCRIPTORS: *Ducts, Theory, Acoustics, Absorption, Acoustic insulation, Acoustic properties, Coatings, Measurement, Gas flow, Configuration, Boundary layer, Attenuation, Scientific research, Velocity, Acoustic impedance, Acoustic filters, Sound transmission.

Theoretical and experimental results on the interaction between sound and air flow in a duct for the following studies are presented: (1) signal amplification as related to size, shape, and position of periodically spaced Helmholtz resonators mounted in the walls of a duct; (2) extension of flow velocity and signal frequency parameters for a duct coated with a porous absorber; and (3) investigation of plate absorbers for their usefulness in wind tunnel applications. Results of these studies show, respectively: (1) the ratio of the Helmholtz resonator neck width to the spacing, for sound propagation in the flow direction, is an important factor; (2) the solution of a wave equation agrees with experimental measurements for frequencies having a wavelength greater than and comparable to the duct diameter; and (3) the attenuation is dependent of the type of plate absorber (pliable, rigid, or resilient) and the flow velocity. The construction of a test duct for determining the sound field influence on the air flow boundary layer over a plate vibrating perpendicular to its surface is also reported. (Author)

AD-296 985 Div. 25, 9
(TISTA/FRL) OTS price $2.25

Goettingen U. (Germany).
RESEARCH ON SOUND PROPAGATION IN SOUND-ABSORBENT DUCTS WITH SUPERIMPOSED AIR STREAMS. VOLUME II.
Final rept. on Biomechanics of Aerospace Operations,
by F. Mechel and W. Schilz. Dec 62, 72p. incl. illus. 4 refs.
(Contract AF 61(052)112, Proj. 7231)
(AMRL TDR 62-140, vol. 2)
Unclassified report

DESCRIPTORS: *Ducts, Theory, Acoustics, Absorption, Acoustic properties, Acoustic insulation, Measurement, Gas flow, Coatings, Scientific research, Velocity, Sound, Attenuation, Acoustic filters, Turbulence, Acoustic impedance, Sound transmission.

It is shown that the attenuation of sound in absorbing ducts with superimposed flow is dependent in a high degree on the direction of the flow and its velocity. The change of attenuation is caused by a convective variation of the acoustic wavelength, by a nonlinear variation of the characteristic constants of the absorber, and by a deformation of the wave fronts in the profile of the mean flow. These changes can be calculated and are in good agreement with the experimental results. In a duct coated with undamped Helmholtz resonators the mechanism of sound amplification is based on the interaction between the sound wave and the turbulence. The conversion of kinetic flow energy into acoustic energy is performed by synchronization of turbulence. For appropriate values for flow velocity and signal frequency a long-range stable wave of pseudo-sound takes place. Sound and pseudo-sound interact with one another at the necks of the resonators. (Author)

AD-296 991 Div. 25, 9
(TISTW/JEA) OTS price $5.60

Bureau d'Analyse et de Recherche Appliquees (France).
ANALOG STUDY OF IMMERGED PROFILES IN PROXIMITY OF THE FREE SURFACE WITH A SURIMPOSED LOAD DISTRIBUTION.
Final rept.
30 Dec 62, 35p. incl. illus. 13 refs.
(Contract N62558-2545)
Unclassified report

DESCRIPTORS: *Fluid flow, *Perturbation theory, *Fluid mechanics, *Pressure, *Electric potential, *Load distribution, Velocity, Viscosity, Integral transforms, Intensity, Vortices, Transformation (Mathematics), Transformers, Functions, Continuum mechanics, Propagation, Linear systems, Surface area, Distribution.

A continuous, irrotational, two-dimensional flow limited by a free surface is considered. The fluid is supposed to be incompressible, perfect and heavy. The complex potential of the flow can be written as follows: $F(z) = Voz + f(z) = \Phi + i\Psi$ where Vo represents the velocity of the uniform flow at upstream infinity and f(z) the complex perturbation potential. We intend to consider the stream function: $\Psi = Voy + \psi$ where ψ represents the stream perturbation which is as Ψ, an harmonic function. This means that the Ψ potential meets the equation: $\partial^2 \psi / \partial x^2 + \partial^2 \psi / \partial y^2 = 0$. (Author)

Division 26 - PRODUCTION AND MANAGEMENT
Division 27 - PROPULSION SYSTEMS

26. PRODUCTION AND MANAGEMENT

AD-296 154 Div. 26, 15
(TISTP/MB) OTS price $1.60

Minnesota U., Minneapolis.
SURVEILLANCE PROBLEMS: POISSON MODELS WITH NOISE,
by I. Richard Savage. Jan 63, 15p. 2 refs.
(Technical rept. no. 20)
(Contract Nonr-71031, Proj. NR 042-003)
Unclassified report

DESCRIPTORS: *Industrial production, Statistical processes, Operations research, Statistical analysis.

AD-296 446 Div. 26, 8, 17
(TISTE/CAM) OTS price $10.10

Fairchild Semiconductor Div., Fairchild Camera and Instrument Corp., Mountain View, Calif.
PRODUCTION ENGINEERING MEASURE 2N914 AND 2N995.
Quarterly rept. no. 2, 31 July-30 Oct 62,
by D. M. Kobrin. 30 Oct 62, 121p. incl. illus. tables.
(Contract DA 36-039-sc-86726)
Unclassified report

DESCRIPTORS: *Transistors, *Manufacturing methods, *Bonding, Stresses, Surfaces, Surface tension, Diffusion, Crystal growth, Thermal stresses, Vibration, Acceleration, Preparation, Dies, Alloys, Silicon, Silicon alloys, Gold alloys, Palladium alloys, Silver alloys, Failure (Mechanics).

A Production Engineering Measure is presented for improvement of production techniques to increase the reliability of 2N914 and 2N995 transistors. Processes to be improved include: (a) lead attach; (b) preparation of substrate for epitaxial growth; (c) header plating; (d) particle elimination; and (e) die attach. (Author)

AD-296 898 Div. 26, 15
(TISTP/GRW) OTS price $1.60

Operations Research Center, U. of Calif., Berkeley.
OPTIMALITY PROPERTIES OF A SPECIAL ASSIGNMENT PROBLEM,
by S. C. Parikh and Roger Wets. 3 Dec 62, 9p. incl. illus. (Research rept. no. 33; Rept. no. IER 172-39)
(Contract Nonr-22283) Unclassified report

DESCRIPTORS: *Matrix algebra, *Operations research, Linear programming, Feasibility studies, Effectiveness, Analysis.

If the cost matrix of an assignment problem has the following property $c_{ij} = |j - i|$ then any basic feasible solution is optimal if and only if its unit components belong to two well defined symmetric regions. The matrix with above mentioned property is called the REORDERING MATRIX, because it arose for the first time in the reordering of nodes of a critical path and other acyclic network problems. (Author)

27. PROPULSION SYSTEMS

AD-296 094 Div. 27
(TISTA/FRL) OTS price $1.10

Naval Research Lab., Washington, D. C.
REPORT ON SPECIAL MEETING TO DISCUSS NON-DESTRUCTIVE TESTS FOR FILAMENT WOUND FIBERGLASS MOTOR CASES ON 24-25 JANUARY 1963 AT AEROJET-GENERAL CORPORATION, SACRAMENTO,
by Stephen D. Hart. 1963, 7p. (Technical memo. no. 221)
(NRL Proj. 62R05-19B)
Unclassified report

DESCRIPTORS: *Rocket cases, Symposia, Glass textiles, Filament wound construction, Nondestructive testing.

AD-296 147 Div. 27, 17
(TISTM/BRW) OTS price $1.60

Stanford Research Inst., Menlo Park, Calif.
TUNGSTEN AND ROCKET MOTORS.
Progress rept. no. 23, 1 Nov 62-31 Jan 63,
by Gerald M. Gordon and David A. Brown.
1 Feb 63, 15p. incl. illus. tables, 2 refs.
(Contract NOrd-18619)
Unclassified report

DESCRIPTORS: *Rocket motors, *Tungsten, Plasma jets, Carbon dioxide, Aluminum compounds, Oxides, Photographic analysis, Thermal stresses, Exhaust gases, Erosion.

The investigation was continued on the use of tungsten in solid propellant rocket motors and involves two main areas of interest. The first area, tungsten erosion, is being studied under simulated exhaust conditions by means of a specially constructed plasma arc erosion apparatus. The second area deals with the effects of thermal shock on tungsten and includes an experimental study and theoretical analysis of the problem. (Author)

AD-296 153 Div. 27
(TISTA/FRL) OTS price $1.10

Marquardt Corp., Van Nuys, Calif.
(No title).
Letter progress rept., 1-26 Jan 63,
by W. A. Whitney. 26 Jan 63, 2p. (Rept. no. 273-14, pt. 1)
(Contract AF 33(657)7770)
Unclassified report

DESCRIPTORS: *Ramjet engines, Storage, Research program administration.

This report presents a description of work performed on the RJ43-MA-11 engine long-term storage evaluation program. (Author)

AD-296 301 Div. 27
(TISTA/FRL) OTS price $2.60

Ogden Air Materiel Area, Hill Air Force Base, Utah.
SHELF LIFE TEST ON ROCKET MOTORS, 15-KS-1000, MK 6 MODS.
Airmunitions test rept.,
by Robert M. Cavett. Feb 63, 21p. incl. illus. tables (Rept. no. OOY-TR-63-4)
Unclassified report

DESCRIPTORS: *Jatos, *Rocket motors (Solid propellant), Life expectancy, Radiography, Tests, Storage, Operation.

This investigation was one phase of a series established to determine the ultimate life of the 15-KS-1000 Rocket Motor. To accomplish this, 24 motors were visually and radiographically inspected and fired using static facilities at Hill Air Force Base, Utah. In order to best evaluate serviceability, temperature conditioning was accomplished at both high and low extremes of 150 F and -75 F. The motors, as in the past, continued to function without incident. Some small drift of the data from normality toward the specifications limits was noted but was not significantly detrimental to affect serviceability. The previous established life of 9 years was confirmed and an extension to 10 years is recommended. (Author)

AD-296 422 Div. 27, 31
(TISTA/FRL) OTS price $1.10

Naval Boiler and Turbine Lab., Philadelphia, Pa.
COMBUSTION PROBLEMS IN ORR AND SEMBOWER INCORPORATED 800 LBS/HR AUXILIARY BOILER (MSO CLASS).
Final rept.,
by J. J. Hardish. 8 Feb 63, 3p. illus. (NBTL proj. no. B-471)
(Proj. S-F013-08-12)
Unclassified report

DESCRIPTORS: *Boilers, Combustion chambers, Oil burners, Air, Nozzles, Fuel nozzles, Ignition, Electrodes, Design, Tests, Combustion, Minesweepers.

The existing burner on the Laboratory's boiler was modified to correspond to that furnished on the MSO-522 Class units. Operating trials were still characterized by pulsations. Operating trials with a new blower system revealed no improvement in combustion performance. Various burner modifications were made and evaluated using both the original and the new blower assemblies. Satisfactory results were finally obtained after several modifications were made to the burner air nozzle arrangement. (Author)

AD-296 857 Div. 27, 26
(TISTA/LSK) OTS price $5.60

Douglas Aircraft Co., Inc., Santa Monica, Calif.
SEGMENTED ROCKET MOTOR CASE PROGRAM.
Quarterly progress rept. no. 3, 15 Oct 62-15 Jan 63,
by R. G. Carpenter and T. R. Jeffus. 15 Jan 63, 54p. incl. illus. tables, 6 refs. (Rept. no. SM-42911)
(Contract AF 04(611)8184, Proj. 3059)
Unclassified report

DESCRIPTORS: *Segmented rocket motors, *Rocket cases, Glass textiles, Processing, Production, Rocket motors (Solid propellant), Filament wound construction.

Research was directed toward design, development, fabrication, and testing of lightweight motor case segments, culminating in a design applicable to large (160 to 240-in. diameter) segmented solid propellant rocket motors. A summary of work accomplished on the bench test program and on the 43-in. dia. subscale segments is included. (Author)

28. PSYCHOLOGY AND HUMAN ENGINEERING

AD-296 227 Div. 28
(TISTB/MS) OTS price $13.50

Princeton U., N. J.
PERSONALITY STRUCTURE, GROUP COMPOSITION, AND GROUP FUNCTIONING.
Doctoral thesis,
by Bruce W. Tuckman. Jan 63, 195p. incl. illus. tables, 53 refs.
(Contracts Nonr-185836 and Nonr-185812, Proj. NR 171-055)
Unclassified report

DESCRIPTORS: *Group dynamics, *Behavior, *Personality, Decision making, Reasoning.

The relation between the level of cognitive abstractness of the members of groups composed homogeneously and the behaviors of such groups were investigated. It was hypothesized that differences in behavior and performance between groups of different composition were predictable on the basis of the theory used for classifying individuals. Dispositional factors were found to be major determinants of group behavior and worthy of intensive study. On the basis of preknowledge of individual personality structure, and using groups composed homogeneously, a number of group behaviors could be predicted quite accurately. Groups of different composition were found to behave differently (such differences being systematic), and that the theory of individual personality, originated by Harvey, Hunt, and Schroder (1961), yields highly predictive results. Abstractness of individual personality structure, and consequent abstractness of group structure, appear to be meaningful dimensions. (Author)

AD-296 374 Div. 28
(TISTB/DGH) OTS price $4.60

Applied Psychological Services, Villanova, Pa.
INFORMATION TRANSFER IN DISPLAY CONTROL SYSTEMS. VI. A MANUAL FOR THE USE AND APPLICATION OF THE DISPLAY EVALUATIVE INDEX.
Quarterly progress rept. no. 6, 16 Sep-15 Dec 62,
by Arthur I. Siegel, William Miehle, and Philip Federman. 15 Dec 62, 40p. incl. illus. tables.
(Contract DA 36-039-sc-87230, Proj. 3A95-20-001)
Unclassified report

DESCRIPTORS: *Instruction manuals, *Human engineering, *Display systems, Design, Command and control systems, Analysis, Indexes, Effectiveness, Decision making.

AD-296 405 Div. 28
(TISTB/DGH) OTS price $2.60

Quartermaster Food and Container Inst. for the Armed Forces, Chicago, Ill.
METHODS OF SHAPING SOLDIERS' ATTITUDES TOWARD QUICK-SERVE MEALS.
Interim rept. on Human Factors in QM Corps Operations,
by Joseph M. Kamen. Dec 62, 27p. incl. tables, 13 refs. (AMXFC rept. no. 41-62)
Unclassified report

DESCRIPTORS: *Military rations, *Attitudes, Communication systems, Acceptability, Applied psychology.

AD-296 781 Div. 28
(TISTB/MS) OTS price $1.10

Indiana U., Bloomington.
PSYCHOLOGICAL AND PHARMACOLOGICAL FACTORS CONTROLLING GASTRO-INTESTINAL MOTILITY.
Progress rept. no. 4, Jan 62-Jan 63,
by Roger W. Russell. Jan 63, 8p.
(Contract DA 49-193-md-2063)
Unclassified report

DESCRIPTORS: *Gastrointestinal system, *Stomach, *Reflexes, *Conditioned reflex, *Drugs, Stress (Physiology), Stress (Psychology), Inhibition, Noise, Secretion, Measurement, Reaction (Psychology), Stimulation, Control, Physiology.

Contents:
Gastrointestinal responses of ''executive'' and control subjects during a noise-avoidance task
Gastrointestinal reactions to response-contingent aversive stimulation
Relations between stomach secretion and electrical recordings from the gastrointestinal system
Gastrointestinal motility in animals with experimentally induced ulcers
Changes in gastrointestinal motility produced by variations in sensory input

AD-296 814 Div. 28, 32
(TISTB/DGH) OTS price $3.60

Institute of Group Relations, U. of Oklahoma. Norman.
THEORETICAL AND RESEARCH REPORTS: VARIETIES OF SOCIAL STIMULUS SITUATIONS,
by Muzafer Sherif and Carolyn W. Sherif. 1961, 24p. incl. illus. 18 refs.
Unclassified report

DESCRIPTORS: *Sociology, *Psychology, *Sociometrics, Adjustment (Psychology), Attitudes, Culture, Decision making, Acceptability, Personality, Behavior, Group dynamics, Social communications.

Paper presented to Symposium on Dimensions of Stimulus Situations Accounting for Behavior Variance, 21 Apr 61 at Texas Christian U., Fort Worth.

AD-296 819 Div. 28
(TISTB/DGH) OTS price $1.60

RAND Corp., Santa Monica, Calif.
VAGUENESS AND DECISION: A REJOINDER,
by Daniel Ellsberg. Feb 63, 10p. (Rept. no. P-2705)
Unclassified report

DESCRIPTORS: *Decision making, Motivation, Reaction (Psychology).

AD-296 960 Div. 28
(TISTB/DGH) OTS price $1.10

Louisville U., Ky.
PERCEPTUAL EVALUATION OF SENSORY INFORMATION.
Semi-Annual progress rept., 1 Sep 62-1 Feb 63,
by John R. Binford. 1 Feb 63, 5p.
(Contract DA 49-193-md-2197)
Unclassified report

DESCRIPTORS: *Sensory mechanisms, *Fatigue (Physiology), *Attention, Amphetamines, Chlorpromazine, Morphine, Emotions, Motivation, Vision, Contraction, Hearing, Thresholds, Muscles, Visual signals.

29. QUARTERMASTER EQUIPMENT AND SUPPLIES

AD-296 149 Div. 29
(TISTB/DGH) OTS price $4.60

Quartermaster Research and Engineering Command, Natick, Mass.
QUARPEL APPLICATION AND TEST METHODS FOR COTTON THREAD,
by Pauline P. Hall, Edward B. Frederick and Howard D. Corkum. Jan 63, 41p. incl. illus. tables, 7 refs. (Textile series rept. no. 124)
Unclassified report

DESCRIPTORS: *Fibers, *Cotton textiles, Military requirements, Standards, Test methods, Finishes and finishing, Moistureproofing, Impregnation.

The application of 'Quarpel' to cotton sewing thread and the resultant water-repellency properties are described. A typical method of application is given. Test methods for determining repellency initially and after laundering have been developed and a new method of handling skeins in these tests has been devised. Data are presented which show the superiority of 'Quarpel'-treated thread over a commercial 'durable' water-repellent compound in accelerated laundering tests. (Author)

AD-296 579 Div. 29
(TISTA/GEC) OTS price $1.60

4750th Test Squadron (Tactics and Application Engineering) Tyndall Air Force Base, Fla.
A/P22S-3 SUIT CONTROLLER.
Final rept.,
by Clarence E. Langford. 9 Jan 63, 12p. incl. illus. (Proj. ADC/73AD/62-29)
Unclassified report

DESCRIPTORS: *Pressure suits, *Parachutes, Test methods, Design, Acceptability, Safety devices, Performance tests.

To prevent interference between the B-5 parachute harness and the suit controller on the larger size A/P22S-3 full pressure suits, ASD proposed that the harness be adjusted using higher than average index numbers and the controller be rotated 60 degrees clockwise. Headquarters ADC directed an evaluation of proposed fix to determine the compatibility of the pressure suit and the parachute harness after the fix was accomplished. There was no interference after the fix was accomplished. The tests were conducted in all possible pressure suit environments. It was concluded that the ASD fix eliminated interference and caused no discomfort to the using aircrew. (Author)

AD-296 847 Div. 29, 26
(TISTA/GEC) OTS price $2.60

Beckman Instruments, Inc., South Pasadena, Calif.
A SMALL ROTARY VAPOR COMPRESSION STILL FOR THE PRODUCTION OF PYROGEN-FREE WATER.
Annual progress rept. no. 1, 1 Apr 62-31 Jan 63,
by Walter Donner. 31 Jan 63, 20p. tables.
(Contract DA 49-193-md-2261)
Unclassified report

DESCRIPTORS: *Evaporators, *Compressors, Desalination, Purification, Pyrogens, Decontamination, Water, Design, Seawater, Vapors.

AD-296 953 Div. 29, 16
(TISTB/JB) OTS price $4.60

Army Medical Research and Nutrition Lab., Denver, Colo.
REVIEW OF THE UNITED STATES ARMY'S IRRADIATED FOOD WHOLESOMENESS PROGRAM,
by M. E. McDowell and N. Raica, Jr. 29 May 62, 34p. tables, 71 refs. (Rept. no. 268)
Unclassified report

DESCRIPTORS: *Food, *Military rations, *Nutrition, Radiation effects, Toxicity, Preservation, Radiation hazards, Army research.

AD-296 996 Div. 29
(TISTB/DGH) OTS price $1.60

Marine Corps Development Center, Quantico, Va.
AIR CONDITIONING EQUIPMENT FOR PILOT FULL-PRESSURE SUITS,
Final rept.
26 Feb 63, 15p. illus.
(Proj. 51-60-01)
Unclassified report

DESCRIPTORS: *Pressure suits, *Air conditioning equipment, Military requirements, Cooling and ventilating equipment.

A service test was conducted in order to determine: (a) the requirement for air conditioning flight personnel when wearing full pressure flight suits during expeditionary deployment, and (b) the type of air conditioning equipment most desirable and the quantities required to fulfill the above requirement. Four expeditionary units were tested. The HAC-12 is a 12-outlet conditioned air supply unit, designed for cooling suited air crew members during briefing and standby periods. The Mobile Expeditionary Pressure Suit Cooler-1 is an 8-outlet self-contained gasoline engine driven air conditioning unit, designed for cooling suited air crew members while they are being transported to and from aircraft. The HD-1 is a suit drying unit designed for drying a single pressure suit and was evaluated in conjunction with the HAC-12 air conditioning unit. The hand portable P/N AJS-1400-1 unit is a hand-held portable liquid oxygen ventilating unit. (Author)

30. RESEARCH AND RESEARCH EQUIPMENT

AD-296 046 Div. 30
(TISTB/DGH) OTS price $7.60

RAND Corp., Santa Monica, Calif.
PROGRAMMING LANGUAGES AND STANDARDIZATION IN COMMAND AND CONTROL,
by J. P. Haverty and R. L. Patrick. Jan 63, 67p. incl. tables, refs. (Memo no. RM-3447-PR)
(Contract AF 49(638)700, Proj. RAND)
Unclassified report

DESCRIPTORS: *Programming languages, *Data processing systems, Training, Costs, Programming (Computers), Measurement, Management engineering, Design, Standardization, Command and control systems.

The almost complete lack of facts and the absence of a standard glossary of terms are major obstacles to any study and evaluation of programming languages. The question of standardizing on a programming language is discussed. The current programming language area is evaluated in terms of three factors--a sufficient base of existing lower level standards, mature technical development, and extensive user experience. The evaluation indicates that it is not now appropriate to establish a standard programming language; however, planning for standardization should be started immediately. Measures short of complete standardization--e.g., partial standardization, standardization on a communication language--may achieve most of the benefits of full standardization and should be examined. (Author)

AD-296 138 Div. 30, 2
(TISTP/JW) OTS price $8.60

Air Force Systems Command, Washington, D. C.
NATURAL ENVIRONMENTAL DATA AND SUPPORT REQUIREMENTS,
Jan 63, 89p. (Rept. no. AFSC TDR 63-2)
Unclassified report

DESCRIPTORS: *Research program administration, *Air force research, Astrophysics, Atmospherics, Analysis, Aurorae, Cosmic rays, Electrons, Protons, Density, Climatology, Meteorology.

The what and the why of present and future Air Force Systems Command requirements for natural aerospace environmental data and information are described. The environmental parameters about which information is desired are enumerated and the purposes for which the information is or will be used are discussed. Included are substantiated, qualitative statements of need for data or support, without regard to whether the support requires R&D action or can be met through existing state-of-the-art technological capabilities. Development of equipments and techniques will certainly be required to fill the gaps in our knowledge and capabilities, but these requirements are not discussed. Background information for those who plan and estimate resources for future natural environmental support to the USAF is provided. (Author)

AD-296 148 Div. 30, 9
(TISTA/GEC) OTS price $5.60

Arnold Engineering Development Center, Arnold Air Force Station, Tenn.
STRESS AND THERMAL ANALYSIS OF THE THROAT SECTIONS 50-INCH MACH 10-12 TUNNEL,
by R. Sherman and J. P. Cook. Feb 63, 46p. incl. illus. tables, 9 refs. (AEDC TDR 62-231)
(Contract AF 40(600)1000)
Unclassified report

DESCRIPTORS: *Hypersonic wind tunnels, Stresses, Thermal stresses, Mathematical analysis, Geometry, Heat transfer, Design.

The design analysis of the throat section for a large (50-inch-diameter test section), continuous flow, axisymmetric wind tunnel is described. The maximum stagnation conditions are 2000 psia and 1450 F. The as-built article, which in essence is simply a water-cooled liner housed in a pressure shell, is described, and a method, which allows reasonable selections of geometry and cooling requirements, outlined. This method is extended to enable forecast of temperature distribution and resultant stress along the throat section and is applied, not only to the Mach 10 configuration, but also to a proposed interchangeable counterpart which would permit aerodynamic testing at Mach 12. Maximum stagnation conditions therein would be 2400 psia and 1940 F. (Author)

Division 30 - RESEARCH AND RESEARCH EQUIPMENT

AD-296 166 Div. 30, 8
(TISTW/PCR) OTS price $3.60

Hughes Research Labs., Malibu, Calif.
FEASIBILITY OF A MESHLESS STORAGE TUBE.
Interim scientific rept. no. 3, 15 Sep-14 Jan 63,
by R. D. Ketchpel. 14 Jan 63, 27p. incl. illus. table, 3 refs.
(Contract AF 33(697)7789)
Unclassified report

DESCRIPTORS: *Storage tubes, Computer storage devices, Electron bombardment, Electric potential, Electrical conductance, Excitation, Electric currents, Theory, Capacitance, Thickness, Memory, Electroluminescence, Thin films (Storage devices), Dielectrics, Feasibility studies.

Studies were conducted on a large number of bombardment-induced-conductivity (BIC) layers, many of which exhibited substantial conductive memory effects as a result of electron-beam excitation. Data are presented which characterize the sustained BIC in these films. These data represent the following: (1) the volt-ampere characteristics, (2) the effect of bombarding electron beam energy and applied field both on the instantaneous BIC response and on the sustained change in conductivity, (3) the effect of the excitation energy on the sustained change in conductivity, and (4) the effect of the applied voltage and sustained currents on the change in the capacitance. Analysis of the data indicates that while the magnitude of the sustained conductivity change is adequate, both the unexcited conductance and thickness of the sustained BIC layers must be increased to effectively modulate the voltage drop across a thin electroluminescent film. An elementary model is proposed to explain some aspects of the behavior of the conductive memory effect. An important element of this model is the existence of a barrier at one of the electrodes. (Author)

AD-296 186 Div. 30
(TISTP/MB) OTS price $5.60

Computer Associates, Inc., Woburn, Mass.
SUMMARY OF A METHOD FOR THE AUTOMATIC CONSTRUCTION OF SYNTAX DIRECTED COMPILERS,
by Stephen Warshall. Dec 62, 1v. incl. illus. 5 refs. (Scientific rept. no. 2)
(Contract AF 19(628)419, Proj. 4641)
(AFCRL 62-955) Unclassified report

DESCRIPTORS: *Computers, *Machine translation, Language, Algebra, Coding, Programming language, Programming.

This report describes a recently developed technique for the rapid realization of compilers for new source languages and new target machines. The method is built around a table-driven translation algorithm. This algorithm is embodied in a small general-purpose (language- and machine-independent) program, called the ''Translater'', which accepts strings of characters, syntactically analyzes them, and emits pseudo-code macro-instructions, performing arbitrarily complex investigations of syntactic context to decide this emission. The Translater is particularized to a given source-target pair by a set of tables which define the syntax of the source language and the strategy to be used in studying context and emitting macros. The newly-developed technique consists of the creation of a readable, formal language for describing both the syntax and the strategy of macro generation; thus, the Translater can, by translating a message in this new language, create an instance of its own tables. (Author)

AD-296 195 Div. 30, 15
(TISTP/MB) OTS price $1.60

Boeing Scientific Research Labs., Seattle, Wash.
A FAST PROCEDURE FOR GENERATING NORMAL RANDOM VARIABLES,
by G. Marsaglia, M. D. MacLaren and T. A. Bray.
Aug 62, 16p. incl. illus. tables, 5 refs. (Mathematical note no. 282; Document no. D1-82-0219)
Unclassified report

Also available from the author.

DESCRIPTORS: *Statistical distributions, *Computers, Probability, Programming (Computers).

A discussion is given of the generation of normal random variables very rapidly in a computer - for example, at the rate of 10,000 - 15,000 per second in the IBM 7090. The method is suitable for any computer. The incorporation of successive improvements has led to a procedure which is fairly easy to program, requires little storage, 300 - 400 constants, is very fast (it takes about as long to generate the normal x as the uniform u from which it comes), and is completely accurate, in the sense that in theory the procedure returns a random variable with exactly the required distribution; in practice the result is an approximation influenced only by the capacity (word length) of the computer. (Author)

AD-296 216 Div. 30
(TISTP/JW) OTS price $4.60

Remington Rand Univac Div., Sperry Rand Corp., St. Paul, Minn.
DIGITAL CORRELATOR STUDY.
Final engineering rept., 1 May-1 Dec 62.
Dec 62, 1v. incl. illus. table.
(Contract NObsr-87424, Proj. SF-007-01-01)
Unclassified report

DESCRIPTORS: *Correlation techniques, *Digital systems, Least squares method, Difference equations, Wave analyzers, Digital computers, Design, Analysis.

This report includes:
WAVEFORM IDENTIFICATION USING DIGITAL TECHNIQUES, by Edward J. Farrell. 2 Oct 62 (Rept. no. EF 2459-35)

A systems design study of a digital correlator for waveform recognition purposes has produced a practical design for hardware implementation of waveform classification as outlined in the original contract. Two approaches to the correlation problem, referred to as the sum-of-products and the least-squared-difference methods, were investigated. With appropriate normalization the sum-of-products method and the least-squared-difference method can both be used for target classification. Latter method has following advantages over former: more economical to implement, less time required to identify a given return, compensation for changes in the noise level and for certain a priori information, and analytical justification. Comparisons are made of several designs based upon the different parameters. (Author)

AD-296 250 Div. 30
(TISTA/GEC) OTS price $2.60

Pennsylvania State U., University Park.
A VERSATILE FIELD ION MICROSCOPE.
Technical rept.,
by S. B. McLane, Jr. and E. W. Muller. Dec 62, 26p. incl. illus. 5 refs.
(Contract Nonr-65623, Proj. NR 017-443)
Unclassified report

DESCRIPTORS: *Microscopes, Design, Metals, Cooling, Liquefied gases, Hydrogen, Solidified gases, Nitrogen, Diffusion pumps, Fluorescent screens, Grain structures (Metallurgy), Laboratory equipment, Ion beams.

An all-metal design of the field ion microscope was proven to be both feasible and versatile. Adaptability, variable magnification, ruggedness, greater safety when used with liquid hydrogen cooling, and high voltage shielding characterize this model. A six-inch-diameter vertical screen, which is easily replaceable, facilitates its use. Application of this model to the study of different screen materials, the use of solid nitrogen cooling, and the study of grain boundaries is described. (Author)

AD-296 297 Div. 30
(TISTP/JW) OTS price $1.60

Land-Air, Inc., Point Mugu, Calif.
REARRANGEMENT OF SUBPROGRAMS ON TAPE TO REDUCE SELECTION TIME,
by Werner E. Knolle. 23 Oct 62, 11p. (Rept. no. 38)
(Contract N123(61756)19425A)
Unclassified report

DESCRIPTORS: *Programming (Computers), *Data storage systems, Computers, Analysis, Magnetic tape, Computer logic.

AD-296 332 Div. 30
(TISTW/JEA) OTS price $1.60

System Development Corp., Santa Monica, Calif.
JOVIAL FOR THE DILETTANTE AND BEYOND: COMPILER ERROR DETECTION LISTS,
by Millard H. Perstein. 2 Jan 63, 19p. (Technical memo. TM-555/063/00)
Unclassified report

DESCRIPTORS: *Computers, *Programming (Computers), *Machine translation, *Control systems, Documentation, *Identification, Processing, Samplers, Analysis, Programming languages, Detectors, Errors, Detection.

AD-296 361 Div. 30
(TISTP/JW) OTS price $1.40

Lockheed Aircraft Corp., Sunnyvale, Calif.
THRESHOLD ELEMENT CIRCUIT MECHANIZATIONS. AN ANNOTATED BIBLIOGRAPHY.
Bibliography for 1960-1962,
comp. by P. R. Stromer. Dec 62, 44p. 95 refs.
(Special bibliography no. SB-62-57; Rept. no. 8-44-62-2)
Unclassified report

DESCRIPTORS: *Switching circuits, *Computers, Computer logic, Subject indexing, Mathematical logic, Bibliographies, Functions.

A bibliography has been prepared from recent (1960 to date) literature on computer threshold switching circuits and their components. Threshold switching devices are designed to perform logical switching functions. One class of switching functions, majority logic functions, has been emphasized in the bibliography. Entries are alphabetically arranged by senior personal author. A subject index is included. (Author)

AD-296 396 Div. 30
(TISTA/GEC) OTS price $5.60

General Electric Co., Schenectady, N. Y.
ION GAUGE CHARACTERISTICS IN AN AEROSPACE SIMULATOR,
by David H. Holkeboer and Donald J. Santeler.
Feb 63, 46p. incl. illus. tables, 2 refs.
(Contract AF 40(600)954, Proj. 7778)
(AEDC TDR 63-37) Unclassified report

DESCRIPTORS: *Ionization gauges, *Space environmental conditions, Pressure, Cryogenics, Theory, Nitrogen, Helium, Design, Gas flow, Simulation.

An investigation was made to determine the relationship of ion gauge readings to the fundamental gas properties of pressure, density, and molecular incidence rate, and to study a modification of the ion gauge for use in space simulators where directional pressures exist because of large cryogenically-cooled pumping areas. A theoretical analysis of the operation of the ion gauge suggested that a nude gauge senses the density of gas in a vacuum chamber, whereas a tubulated gauge senses the amount of molecular flux incident on the mouth of the tubulation; neither gauge actually measures pressure. Experiments were then conducted with specially constructed gauges in a vacuum system where the gas parameters could be varied individually to check the validity of the analysis. The predicted behavior was obtained with both nitrogen and helium, although some anomalous results were seen in the latter case. The modified ion gauge, also known as the Space Simulation Gauge, is a tubulated gauge incorporating a cryogenic pumping surface to reduce the response to the incident flux of condensible molecules as if the flux were reflected from the wall of the space chamber having cryogenic pumping panels. A means of calculating the proper pumping area within the gauge was developed and applied. The ability to produce the intended reduction in sensitivity was experimentally confirmed, and some effects of gauge geometry were explored. (Author)

AD-296 522 Div. 30, 1
(TISTP/TL) OTS price $2.60

Cornell Aeronautical Lab., Inc., Buffalo, N. Y.
PERCEIVING AND RECOGNITION AUTOMATA.
Annual rept., 1 Jan-31 Dec 62 on Project PARA,
by J. L. Muerle. 31 Dec 62, 1v. incl. illus.
(Contract Nonr-238100)
Unclassified report

DESCRIPTORS: *Pattern recognition, *Reading machines, *Adaptive control systems, Display systems, Helicopter, Pitch (Motion), Roll, Oscilloscope, Noise, Statistical analysis, Communications theory, Weight, Errors, Probability, Catalogs, Automation, Simulation.

AD-296 532 Div. 30
(TISTP/JW) OTS price $6.60

Thompson Ramo Wooldridge, Inc., Canoga Park, Calif.
AN ON-LINE COMPUTING CENTER FOR SCIENTIFIC PROBLEMS,
by Glen J. Culler and Burton D. Fried. 11 Jan 63, 1v. incl. illus. table, refs. (Rept. no. M19-3U3)
(Contract AF 30(602)2762)
Unclassified report

DESCRIPTORS: Digital systems, Information retrieval, Digital computers, Computer logic, Computers, Research program administration.

An on-line digital system allowing an unusually direct coupling between the user (physicist, mathematician, engineer) and the computer is described. This system, which has been successfully operated during the past six months, was designed principally to provide assistance for problems whose structure is partially unknown (and frequently surprising). These typically require the development of new methods of attack, and hence an amount of program experimentation not feasible with classical computer center organizations. With the system described here, the interaction between user and computer is close enough to permit effective use of a scientist's intuition and of his detailed understanding of techniques and procedures, machine representations of those tools he considers essential to his area, and then use these, on-line, to study or solve problems of interest. (Author)

AD-296 539 Div. 30, 8
(TISTP/TL) OTS price $1.10

Southwest Research Inst., San Antonio, Tex.
MULTIKILOCURIE RADIATION EFFECTS FACILITY.
1963, 6p. incl. illus. (Rept. no. EE-415)
Unclassified report

DESCRIPTORS: *Radiation effects, *Test equipment, Test facilities.

AD-296 559 Div. 30
(TISTB/DGH) OTS price $4.60

Southwest Research Inst., San Antonio, Tex.
FIELDS OF ACTIVITY AND EXPERIENCE.
30 July 61, 45p.
Unclassified report

DESCRIPTORS: *Scientific research, *Scientific organizations, Acoustic ranges, Aeronautical laboratories, Analog systems, Chemical analysis, Bearings, Biological laboratories, Biophysics, Structures, Industrial research, Ceramic materials, Chemical engineering, Economics, Electromagnetism, Geology, Communications theory, Lubricants, Test facilities, Laboratories.

AD-296 565 Div. 30, 2
(TISTW/JEA) OTS price $3.60

Naval Oceanographic Office, Washington, D. C.
INSTRUMENTATION AND PROCEDURES FOR DIGITAL TO ANALOG CONVERSION OF SONIC SURFACE SCANNER DATA FOR INPUT TO AN ANALOG WAVE ANALYZER,
by P. S. DeLeonibus and A. Fleischhaker. Feb 62, 27p. incl. illus. tables, 9 refs.. (Rept. no. TR-121)
Unclassified report

DESCRIPTORS: *Digital-to-analog converters, *Wave analyzers, *Transducers (Acoustics), *Recording systems, *Scanning sonar, Submarines, Surface area, Energy, Surface properties, Operations, Motion, Delay circuits, Pulse counters, Data processing systems, Ocean waves, Digital computers, Height finding.

Electronic devices and procedures required to convert discrete ocean surface wave height data into a form suitable for input to a wave analyzer are described. Such wave height data, obtained with an inverted echo sounder (Sonic Surface Scanner) mounted on the deck of a submerged, hovering submarine, are recorded on magnetic tape as a sequence of pulse packets. An example of a power spectral estimate of Sonic Surface Scanner wave height data by digital and analog methods is presented to illustrate techniques used at the U. S. Navy Hydrographic Office. (Author)

AD-296 589 Div. 30
(TISTP/MB) OTS price $21.00

System Development Corp., Santa Monica, Calif.
A SIMPLIFIED APPROACH TO JOVIAL (A TRAINING DOCUMENT),
by Phyllis R. Kennedy. 17 Sep 62, 387p. incl. illus. tables, refs. (Technical memo. rept. TM-780/000/00)
Unclassified report

DESCRIPTORS: *Computers, Machine translation, Programming (Computers), Programming language.

The approach of the JOVIAL language system is to give the various computers an automatic means of accepting instructions and compiling these instructions automatically into a specific machine language. (Author)

AD-296 590 Div. 30
(TISTP/JW) OTS price $1.60

System Development Corp., Santa Monica, Calif.
THE DEPENDENCY OF A SIMULATION LANGUAGE ON A THEORY OF SYSTEMS.
by Michael R. Lackner. 28 Jan 63, 9p. 9 refs.
(Technical memo. rept. TM-602/400/00)
Unclassified report

DESCRIPTORS: *Language, *Digital systems, Models (Simulations), Geometric forms, Computer logic, Simulation, Theory.

Discusses the relationship of a simulation language to a theory of systems. States that in the development of digital simulation systems, more attention has been paid to language than to theory. Reports that because any programming language can be used to code a simulation model, the view has developed that more economical production of simulation models can be achieved by simply refining existing languages. States that this leads to the unfortunate result that production of specious computer programs becomes easy while the fundamental problem of producing valid simulation models remains difficult. Concludes that the language must express the subject matter of the theory; the theory must be capable of recognizing the suppositions and drawing the consequences. (Author)

AD-296 598 Div. 30, 8
(TISTP/TL) OTS price $4.60

RAND Corp., Santa Monica, Calif.
REMOVING THE NOISE FROM THE QUANTIZATION PROCESS BY DITHERING: LINEARIZATION,
by G. G. Furman. Feb 63, 40p. incl. illus. tables, 17 refs. (Research memo. no. RM-3271-PR)
(Contract AF 49(638)700, Proj. RAND)
Unclassified report

DESCRIPTORS: *Control systems, *Digital systems, *Data transmission systems, Analog-to-digital convertions, Digital-to-analog convertions, Computers, Automatic, Band pass filters, Signals, Non-linear systems, Linear systems, Statistical analysis, Statistical processes, Analog systems, Input-output devices, Low pass filters, Feedback, Control, Sampling.

The linearization of the highly important multistep quantizer nonlinearity by the application of independent quantizer activators called dithers is treated. For the dithered quantizer acting (as it often does) in conjunction with a low-pass or band-pass filter, numerical answers are given for the first time to the following questions: (1) What is the equivalent

quantizer gain? (2) What upper bounds does the dither place upon the maximum deviation from linearity? (3) How does one determine, for given specifications, a dither amplitude so that the system is optimally dithered? Such information, with regard to two time-periodic dithers (the sinusoid and sawtooth) makes it possible to effect analog-to-digital-to-analog conversion (to name one application) with no apparent loss of information even when the quantization is rough. The properties of the sinusoidal and sawtooth waves as quantizer linearizers are developed in detail; it is shown that the sawtooth is superior to the more popular sinusoid in most important respects. (Author)

AD-296 769 Div. 30, 4, 17, 14
(TISTW/JEA) OTS price $6.60

Radiation Effects Information Center, Columbus, Ohio.
MONTHLY ACCESSION LIST 60.
Report for 1 July 62-31 Jan 63.
15 Feb 63, 59p. (REIC Accession list no. 60)
(Contract AF 33(657)10085; Continuation of Contract AF 33(616)737e, Proj. nos. 7381; 7634)
Unclassified report

DESCRIPTORS: *Information retrieval, *Documentation, *Radiation effects, Organic materials, Inorganic compounds, Electronics, Polymers, Metals, Ceramics materials, Space environmental conditions, Test facilities, Radiological dosage, Dosimeters, Bibliographies, Materials.

Contents:
Organic and inorganic compounds
Electronics
Polymers
Metals and ceramics
Dosimetry
Facilities
Space

AD-296 783 Div. 30
(TISTA/GEC) OTS price $8.60

European Office of Aerospace Research, Brussels (Belgium).
BIBLIOGRAPHY OF TECHNICAL NOTES AND TECHNICAL REPORTS. SUPPLEMENT.
1 Jan 63, 91p.
Unclassified report

DESCRIPTORS: *Bibliographies, *Scientific research, Biology, Chemistry, Electronics, Geophysics, Materials, Mathematics, Metallurgy, Physics, Propulsion, Solid state physics, Air force research.

AD-296 791 Div. 30
(TISTB/MS) OTS price $7.60

Lincoln Lab., Mass. Inst. of Tech., Lexington.
UNCLASSIFIED PUBLICATIONS OF LINCOLN LABORATORY SUPPLEMENT 2.
15 Dec 62, 70p.
(Contract AF 19(628)500)
(AFESD TDR 62-271) Unclassified report

DESCRIPTORS: *Reports, Radio communication systems, Physics, Radar, Data processing systems, Solid state physics, Atmosphere entry, Engineering, Command and control systems, Indexes.

AD-296 824 Div. 30, 14
(TISTM/RGR) OTS price $1.00

Rock Island Arsenal Lab., Ill.
ENZYMATIC DEOXYGENATION A NEW CONCEPT IN CORROSION PREVENTION.
Rept. no. 2,
by W. F. Garland. 17 Oct 62, 35p. incl. illus. 20 refs. (Rept. no. 62-3441)
(Proj. 593-32-007)
Unclassified report

DESCRIPTORS: *Packing materials, *Oxidoreductases, Storage, Corrosion inhibition, Enzymes, Aluminum compounds, Oxides, Oxygen.

An improved deoxygenating packet utilizing activated alumina as the substrate material for the deoxygenating liquid (glucose oxidase preparation) is described. (Author)

AD-296 833 Div. 30
(TISTP/JW) OTS price $1.60

System Development Corp., Santa Monica, Calif.
JOVIAL-X.2, THE LANGUAGE OF THE ONE PASS JOVIAL COMPILER,
by E. Book, H. Bratman, and J. Schwartz.
31 Jan 63, 11p. incl. tables (Rept. no. TM-970/002/00)
Unclassified report

DESCRIPTORS: *Computers, *Data processing systems, Information retrieval, Tables, Computer storage devices, Dictionaries, Computer logic.

AD-296 834 Div. 30
(TISTP/JW) OTS price $1.10

System Development Corp., Santa Monica, Calif.
A ONE PASS JOVIAL COMPILER,
by E. Book, H. Bratman, and J. Schwartz.
22 Jan 63, 3p. (Rept. no. TM-970/001/00)
Unclassified report

DESCRIPTORS: *Computers, *Data processing systems, Design, Generators, Information retrieval, Programming (Computers), Computer logic.

An investigation into improved techniques in compiling and debugging has resulted in the production of a small fast compiler which operates on a subset of JOVIAL. This subset has been named JOVIAL-X-2. The compiler processes a program on the IBM 7090 and produces 7090 binary instructions. (Author)

AD-296 835 Div. 30
(TISTP/JW) OTS price $2.60

System Development Corp., Santa Monica, Calif.
MANAGEMENT ASPECTS OF COMPUTER PROGRAMMING FOR COMMAND AND CONTROL SYSTEMS,
by Vic LaBolle. 17 Dec 62, 20p. incl. illus.
(Rept. no. SP-1000/000/01)
Unclassified report

DESCRIPTORS: *Computers, *Command and control systems, Costs, Feasibility studies, Programming (Computers), Management engineering.

AD-296 843 Div. 30, 15
(TISTP/WH) OTS price $1.60

Washington U., Seattle.
A GENERAL UTILITY CORRELATION PROGRAM FOR IBM

709 WITH PROVISIONS FOR MISSING DATA,
by Richard C. Sorenson and Thomas D. F. Langen.
Jan 63, 12p.
(Contract Nonr-47733 and Grant M-743(C7))
Unclassified report

DESCRIPTORS: *Statistical analysis, *Programming (Computers), Digital computers, Correlation techniques, Experimental data, Programming languages.

AD-296 907 Div. 30, 6
(TISTW/JEA) OTS price $9.60

Philco Corp., Palo Alto, Calif.
LIFE TEST ON WDL-RT-5A RADAR BEACON TRANSPONDER WITH 6-COMMAND DECODER.
Technical operating rept.
31 Jan 63, 115p. incl. illus. tables (Rept. no. WDL-TR1946)
(Contract AF 04(695)278)
Unclassified report

DESCRIPTORS: *Transponders, *Radar beacons, Flight testing, Specifications, S band, Transistors, Radar transmitters, Radar receivers, Sensitivity, Power supplies, Resistance (Electrical), Life expectancy, Reliability (Electronics), Radar equipment.

AD-296 962 Div. 30
(TISTP/JW) OTS price $4.60

IBM Research Center, Yorktown Heights, N. Y.
ADAM - A PROBLEM ORIENTED SYMBOL PROCESSOR,
by Alvin P. Mullery, Ralph F. Schauer, and Rex Rice. 20 Dec 62, 36p. incl. illus. (Scientific rept. no. 1)
(Contract AF 19(628)1621, Proj. 4641)
(AFCRL 62-964) Unclassified report

DESCRIPTORS: *Digital computers, *Data processing systems, Language, Computer storage devices, Dynamics, Input-output devices.

AD-296 998 Div. 30
(TISTP/JW) OTS price $7.60

Electronic Systems Lab., Mass. Inst. of Tech., Cambridge.
AN ALGORITHMIC THEORY OF LANGUAGE,
by Douglas T. Ross. Nov 62, 68p. incl. illus. 18 refs. (Technical memo. no. ESL-TM-156)
(Contract AF 33(600)42859)
Unclassified report

A preprint submitted to the Journal of the Association for Computing Machinery, Nov 63.

DESCRIPTORS: *Language, Mathematical analysis, Algebras, Theory.

The Algorithmic Theory of Language takes the view that processing algorithms define classes of language. A language belongs to a class depending upon whether or not it is properly processed by the corresponding algorithm. Following preliminary statement of n-component element and plex definitions, several general principles concerning the step-by-step growth of large, complex structures are introduced. The words and symbols of language are then considered to be elements with attractive and repulsive properties which cause them to link together to form linguistic structures. The general principles are applied to suitable element definitions to yield derivations of successively more elaborate algorithms defining the behavior of these elements, and generating in one left-to-right pass the First-Pass Structure which explicitly exhibits the syntactic and semantic structure of a statement by showing syntactic context by a tree structure and semantic context by the ''precedence string.'' The present development stops with the concepts of major and minor modifiers and leaves ambiguity resolution and other topics to future papers. (Author)

31. SHIPS AND MARINE EQUIPMENT

AD-296 069 Div. 31, 15
(TISTW/PCR) OTS price $6.60

RAND Corp., Santa Monica, Calif.
ANALYSIS OF THE RESPONSE OF MOORED SURFACE AND SUBSURFACE VESSELS TO OCEAN WAVES,
by J. J. Leendertse. Jan 63, 51p. incl. illus. 14 refs. (Research memo. no. RM-3368-PR)
(Contract AF 49(638)700, Proj. RAND)
Unclassified report

DESCRIPTORS: *Ships, *Ocean waves, *Mooring, Underwater, Mooring buoys, Errors, Mathematical analysis, Fluid dynamic properties, Simulation, Motion, Pitch (Motion), Yaw, Nonlinear systems, Effectiveness, Submarines.

This study analyzes the response of a moored ship or submersible craft, in uniform or irregular waves, and also the forces in the mooring lines induced by ship responses. The response in heave, surge, and pitch of a moored ship or submersible craft with known hydrodynamic characteristics to waves approaching head-on can be calculated by use of the method outlined in this Memorandum. Computed values of the response of a moored 880-ton vessel (simulated by a rectangular block of equivalent displacement), moored in uniform waves, are found to compare favorably with results of model tests. (Author)

AD-296 178 Div. 31
(TISTM/ODN) OTS price $7.60

David Taylor Model Basin, Washington, D.C.
LONGITUDINAL STRENGTH AND MINIMUM WEIGHT,
by Jan R. Getz. Dec 62, 74p. incl. illus. tables, 25 refs. (Rept. no. 1649)
Unclassified report

DESCRIPTORS: *Ship models, *Ship plates, Cargo ships, Oceanographic vessels, Ship structural components, Theory, Weight, Stresses, Fracture (Mechanics), Thermal stresses, Mechanical properties, Design, Failure (Mechanics).

The danger of brittle fracture and fatigue and the importance of built-in or thermal stresses are discussed, while the calculations are based on a tough material whose yield point is the maximum effective strength under tension and is determined by the plastic buckling strength under compression. The advantages of working beyond the buckling strength are discounted on the basis of the actual plate thickness and the shape of the initial distortions. The corrosion allowance is kept separate from the strength norm and a length-dependent working stress is not used. The longitudinal stresses are based on statistical measurements and calculations with an economy-based risk of damage or need for

change of speed and course. The danger of complete structural failure is discussed. As a basis for these observations, measurements from ships are compared with oceanographical data and statistical calculations based on them. The influence on the bending moment of ship motions at sea is discussed. (Author)

AD-296 281 Div. 31, 25, 9
(TISTP/JW) OTS price $4.60

Boeing Scientific Research Labs., Seattle, Wash.
THE FORCED OSCILLATION OF SHALLOW DRAFT SHIPS,
by W. D. Kim. Dec 62, 39p. illus. 8 refs.
(Flight Sciences Lab. rept. no. 65; Document no. D1-82-0222)
Unclassified report

Also available from the author.

DESCRIPTORS: *Motion, *Ship hulls, Fluid flow, Density, Damping, Integral equations, Oscillation, Design.

Considering a three-dimensional disk with a circular or elliptic waterplane as a ship of shallow draft, the interaction between the disk oscillating with six degrees of freedom and the induced motion of the surrounding fluid is investigated. The potential problem is formulated by the use of the concept of surface distributed sources so that an integral equation for the source density is obtained. The numerical solution of the integral equation is found and the dependence of added mass, added moment of inertia, and damping factors on various frequencies is determined. (Author)

AD-296 327 Div. 31, 8
(TISTE/CRJ) OTS price $19.75

Davidson Lab., Stevens Inst. of Tech., Hoboken, N. J.
NOTES OF 4TH BI-ANNUAL SEMINAR SHIP BEHAVIOR AT SEA, 11-15 JUNE 1962, SPONSORED BY OFFICE OF NAVAL RESEARCH, STEVENS INSTITUTE OF TECHNOLOGY WITH COOPERATION OF WEBB INSTITUTE OF NAVAL ARCHITECTURE.
Jan 63, 1v. incl. illus. tables, refs. (Rept. no. TM-136)
Unclassified report

DESCRIPTORS: *Ships, *Hydrodynamics, *Hydrofoil boats, *Symposia, Motion, Roll, Theory, Stability, Control systems, Ground effect, Ship hulls, Oscillation, Ocean waves, Analysis, Stresses, Mathematical analysis, Submarines.

AD-296 420 Div. 31, 7, 8
(TISTM/SJR) OTS price $1.10

Material Lab., New York Naval Shipyard, Brooklyn.
ATMOSPHERIC CONTAMINATION FROM SELENIUM RECTIFIERS SF-013-12-09.
Final rept.
18 Feb 63, 8p. incl. illus. table, 7 refs. (Lab proj. no. 5319-39)
Unclassified report

DESCRIPTORS: *Naval vessels (Combatant), *Atmospheric pollution, *Selenium, Safety, Dry disk rectifiers, Hazards.

Based on the experimental data included in this report of selenium contamination of the atmosphere produced by electrical loading of selenium rectifiers on surface vessels and nuclear submarines, and by loading, overloading and subsequent burnout of selenium rectifiers under both laboratory, static and dynamic ventilation, shipboard simulated conditions, it is concluded that no hazard exists to shipboard personnel other than those responsible for electronic repair or maintenance, regarding selenium contamination of the atmosphere. (Author)

AD-296 584 Div. 31
(TISTM/SJR) OTS price $1.60

Naval Research Lab., Washington, D. C.
THE PERFORMANCE OF LEAD-SILVER ANODES IN CATHODIC PROTECTION OF RESERVE FLEET VESSELS AT THE SAN DIEGO GROUP, PACIFIC RESERVE FLEET.
Interim rept.,
by L. J. Waldron. Dec 62, 9p. incl. illus. 5 refs. (NRL memo. rept. no. 1378)
Unclassified report

DESCRIPTORS: *Cathodic protection, *Naval vessels (Combatant), *Anodes, Lead alloys, Silver alloys, Destroyers.

AD-296 999 Div. 31
(TISTA/GEC) OTS price $2.60

Lockheed Aircraft Corp., Burbank, Calif.
A LIMITED INVESTIGATION INTO THE TRANSIENT LONGITUDINAL STABILITY OF A SMALL SURFACE PIERCING HYDROFOIL BOAT.
Final rept.
18 July 62, 23p. incl. illus. tables (Rept. no. 16112)
(Contract Nonr-340100)
Unclassified report

DESCRIPTORS: *Hydrofoil boats, Stability, Theory, Tests, Configuration, Equations, Motion, Jet propulsion, Pitch (Motion).

32. MISCELLANEOUS ARTS AND SCIENCES

AD-296 064 Div. 32
(TISTB/DGH) OTS price $1.60

RAND Corp., Santa Monica, Calif.
RESEARCH ON COMMUNIST CHINA'S FOREIGN TRADE: COMMENTS ON THREE PAPERS BY SHUN-HSIN CHOU, ROBERT F. DERNBERGER, AND FENG-HWA MAH,
by Oleg Hoeffding. Jan 63, 18p. incl. tables, refs. (Rept. no. P-2689)
Unclassified report

DESCRIPTORS: *Economics, *Commerce, Standardization, Classification, Communism, Foreign policy.

AD-296 074 Div. 32
(TISTB/DGH) OTS price $2.60

Air Force Academy, Colo.
INTERNATIONAL ORGANIZATIONS AND MILITARY SECURITY SYSTEMS.
Nov 62, 28p. refs. (Special Bibliography series no. 25)
Unclassified report

DESCRIPTORS: *Bibliographies, *Political science, United Nations, Foreign policy.

Contents:
General
International Court of Justice
International organizations
League of Nations
North Atlantic Treaty Organization

Organization of American States
Southeast Asia Treaty Organization
Trouble spots
Union of Soviet Socialist Republics
United Nations
Reference works

AD-296 075 Div. 32
(TISTB/DGH) OTS price $2.60

Air Force Academy, Colo.
AMERICAN NATIONAL GOVERNMENT.
Dec 62, 25p. refs. (Special Bibliography series no. 26)
Unclassified report

DESCRIPTORS: *Bibliographies, *United States Government, Political science.

Contents:
General works
Constitutional principles and background
The executive branch
The legislative branch
The judiciary and civil liberties
Parties, pressure groups and public opinion
Government in action

AD-296 179 Div. 32
(TISTB/MS) OTS price $9.10

California U., Berkeley.
NOTES ON THE THEORY OF ECONOMIC PLANNING.
Report on Economics of Information and Organization,
by Roy Radner. Jan 63, 105p. incl. illus. refs. (Technical rept. no. 9)
(Contract Nonr-22277, Proj. NR-047-029)
Unclassified report

DESCRIPTORS: *Economics, Mathematical predictions, Production, Management engineering, Theory.

AD-296 427 Div. 32, 30
(TISTB/DGH) OTS price $1.60

Thompson Ramo Wooldridge, Inc., Canoga Park, Calif.
REVIEW OF STRUCTURE OF LANGUAGE AND ITS MATHEMATICAL ASPECTS.
Technical note on Inductive Methods in Semantic Analysis,
by Paul Garvin, ed. by Roman Jakobson. 26 Dec 62, 11p. (Technical note no. 5)
(Contract AF 49(638)1128)
Unclassified report

Proceedings of Symposia in Applied Mathematics, American Mathematical Society, Vol. 12, 279p. 1961, Providence, R. I.

DESCRIPTORS: *Language, *Mathematics, Dictionaries, Data processing systems, Vocabulary, Models (Simulation).

AD-296 428 Div. 32, 30
(TISTB/DGH) OTS price $2.60

Thompson Ramo Wooldridge, Inc., Canoga Park, Calif.
RESEARCH IN SEMANTIC STRUCTURE.
Technical note on Inductive Methods in Semantic Analysis,
by Paul L. Garvin. 15 Jan 63, 22p. incl. tables. (Technical note no. 6)
(Contract AF 49(638)1128)
Unclassified report

Presented at 37th Annual Meeting Linguistic Society of America, 28-30 December 1962, New York, N. Y.

DESCRIPTORS: *Language, Data processing systems, Vocabulary, Classification, Analysis.

The semantic classification revealed by predication-typing does not coincide with the formal grammatical division into word classes. Function words--such as conjunctions and prepositions--when viewed in the light of predication-typing turn out to have significant elements of meaning in common with content words--such as certain verbs and nouns. An example of this is the semantic spectra of the function word from and the content word result shown on the handout. (Author)

AD-296 481 Div. 32, 28
(TISTB/MS) OTS price $4.60

Michigan State U. Coll. of Communication Arts, East Lansing.
THE PUBLIC'S OPINIONS ON EXISTING OR POTENTIAL FEDERAL FALLOUT SHELTER PROGRAMS.
by David K. Berlo. Sep 62, 43p. incl. tables.
(Contract OCD-OS-62-19)
Unclassified report

DESCRIPTORS: *Public opinion, Operations research, Probability, Attitudes, United States Government, Radioactive fallout, Shelters.

Data obtained from a national probability sample of 2,000 adult Americans are analyzed. The study obtained indices of public attitudes toward the probability of nuclear war, the utility of fallout shelters, and the desirability of various civil defense programs of the Office of Civil Defense. Response differences that were related to various demographic variables were analyzed, and three groups which are maximally different in their receptivity to shelter programs were compared. (Author)

AD-296 776 Div. 32
(TISTB/DGH) OTS price $1.60

California U., Los Angeles.
JOBSHOP-LIKE QUEUEING SYSTEMS,
by James R. Jackson. Jan 63, 18p. refs.
(Working paper no. 27; Research rept. no. 81)
(Contracts Nonr-23373 and Nonr-23375)
Unclassified report

DESCRIPTORS: *Queueing theory, *Management engineering, *Operations research, Distribution, Industrial research, Probability, Industries.

The equilibrium joint probability distribution of queue lengths is obtained for a broad class of jobshop-like ''networks of waiting lines,'' where the mean arrival rate of customers depends almost arbitrarily upon the number already present, and the mean service rate at each service center depends almost arbitrarily upon the queue length there. This extension of the author's earlier work is motivated by the observation that real production systems are usually subject to influences which make for increased stability by tending, as the amount of work-in-process grows, to reduce the rate at which work is injected or to increase the rate at which processing takes place. (Author)

AD-296 808 Div. 32
(TISTB/DGH) OTS price $4.60

Lockheed Aircraft Corp., Sunnyvale, Calif.
ALGORITHMIC STUDIES OF ENGLISH MONOSYLLABICS FOR PREDICTION OF PARTS OF SPEECH: AN ANNOTATED BIBLIOGRAPHY,
comp. by E. E. Graziano. Oct 62, 42p. (Special bibliography no. SB-62-29; Rept. no. 6-90-62-56)
Unclassified report

DESCRIPTORS: *Speech, *Language, *Bibliographies, Vocabulary.

This bibliography consists of 207 selected references of interest to researchers engaged in algorithmic studies of English monosyllabics so as to be able to predict the parts-of-speech of any English word without regard to semantics. The most significant result of the literature search was to confirm beyond a reasonable doubt that the specific mode of application of the logical-empirical method to the English language by LockHeed researchers, and results obtained, are new and unique. The search covered the period from 1500 A. D. to June 1962. (Author)

AD-296 813 Div. 32, 28
(TISTB/DGH) OTS price $3.60

Institute of Group Relations, U. of Oklahoma, Norman.
THEORETICAL AND RESEARCH REPORTS: CATEGORIZATION IN SOCIAL JUDGMENT,
by Carolyn W. Sherif. Nov 62, 23p. incl. illus. tables.
Unclassified report

DESCRIPTORS: *Decision making, *Sociology, Group dynamics, Verbal behavior, Sociometrics, Classification, Culture, Acceptability.

AD-296 837 Div. 32
(TISTB/DCH) OTS price $2.60

Princeton U., N. J.
LIMITS TO THE USES OF MATHEMATICS IN ECONOMICS,
by Oskar Morgenstern. 4 Jan 63, 21p. refs.
(Research memo. no. 49)
(Contract Nonr-185816)
Unclassified report

DESCRIPTORS: *Economics, *Mathematics, Social sciences, Mathematical analysis, Models (Simulators), Game theory.

33. TRANSPORTATION

AD-296 042 Div. 33
(TISTM/ODN) OTS price $5.60

Army Engineer Waterways Experiment Station, Vicksburg, Miss.
TOTAL THICKNESS AND COMPACTION REQUIREMENTS FOR FLEXIBLE PAVEMENTS TO BE SUBJECTED TO CHANNELIZED TRAFFIC,
by C. D. Burns. Nov 62, 1v. incl. illus. tables.
(Technical rept. no. 3-610)
Unclassified report

DESCRIPTORS: *Pavements, Traffic, Materials, Deformation, Deflection, Thickness, Density, Construction, Gravel, Clay, Sand, Limestone, Runways, Tests.

In 1955, because of pavement distress occurring under B-47 channelized traffic, flexible pavement design criteria were revised to increase total thickness above subgrade, compaction requirements for subgrades, and base course thickness. To validate the revised total thickness criteria, and develop compaction requirements for cohesionless subgrades, a test section was constructed consisting of: (1) three different total thicknesses over a clay subgrade with CBR of 10, and (2) a sand subgrade, with loosely compacted bottom 6 ft and densely compacted top 2 ft, overlaid by proper thickness of base and pavement based on revised thickness criteria. Traffic tests were performed in which number of coverages, test load weight, tire pressure, and total thickness were varied. Results indicated that the increase in total thickness is not needed, and the increased or current compaction requirements are adequate for cohesionless materials below the 3-ft depth but all cohesionless material above the 3-ft depth should be compacted to the highest practicable density. (Author)

NON-MILITARY AND OLDER MILITARY RESEARCH REPORTS

*Descriptors marked with an asterik are included in the subject index.

AGRICULTURE

TID-17307 OTS $1.10

Max-Planck-Institut für Zuchtungsforschung, Cologne (West Germany).
DEVELOPMENT OF SELECTION METHODS FOR INDUCED SMALL MUTATIONS IN HIGHER PLANTS (WITH SPECIAL REGARD TO MUTATIONS OF YIELDING CAPACITY). Progress rept. 16 Oct 61-31 Aug 62, on Contract AT(30-1)2619. 8 Nov 62, 9p. 4 refs.

ASTRONOMY

NASA N63-11536 OTS $2.25

Lewis Research Center, National Aeronautics and Space Administration, Cleveland, Ohio.
THE N-BODY CODE - A GENERAL FORTRAN CODE FOR SOLUTION OF PROBLEMS IN SPACE MECHANICS BY NUMERICAL METHODS, by William C. Strack, Wilbur F. Dobson, and Vearl N. Huff. Jan 63, 93p. 11 refs. Technical note D-1455.

Astrophysics

NASA N63-12594 OTS $0.50

Goddard Inst. for Space Studies, National Aeronautics and Space Administration, New York.
THE COLLAPSE PHASE OF EARLY SOLAR EVOLUTION, BY A. G. W. Cameron. Jan 63, 14p. 2 refs. Technical note D-1682.

NASA N63-12595 OTS $0.50

Goddard Inst. for Space Studies, National Aeronautics and Space Administration, New York.
THE ORIGIN OF ATMOSPHERIC XENON, by A. G. W. Cameron. Feb 63, 7p. 7 refs. Technical note D-1685.

TID-17074 OTS $1.60

Laboratory for Nuclear Science, Mass. Inst. of Tech. Cambridge.
INTERPLANETARY PLASMA, by Bruno Rossi. Rept. on Contract AT(30-1)2098. 29 Oct 62, 17p. 21 refs.

BEHAVIORAL SCIENCES

AD-281 044 OTS $2.60

Duke U. [Durham, N. C.]
CAN SUBJECTS BE HUMAN AND HUMANS BE SUBJECTS, by Kurt W. Back. Technical rept. no. 3 on Contract Nonr-1181(11). [1961] 26p. 18 refs.

DESCRIPTORS: *Information theory, *Reasoning, Mathematical analysis, Bionics, *Social communication, Communication theory, *Language, Perception, Reaction (Psychology), Behavior, *Psychometrics.

The social psychologist is a human being who can reason or speculate, like or dislike, construct theories or conduct experiments, jump to conclusions or make commitments. The subject with whom he deals often seems to be a sort of mechanism which is designed to fit a certain theory and who is supposed to ignore everything else. This paper states some problems faced by the social psychologist who tries to modify this approach in a way such that he is not the only man on earth, and considers the way in which this approach to social psychology can be reconciled with formal mathematical reasoning.

AD-281 042 OTS $1.60

Duke U., Durham, N. C.
THE EFFECT OF GROUP INTERACTION UPON CENTRAL NERVOUS SYSTEM AROUSAL IN MAN, by Morton D. Bogdonoff, Kurt W. Back and others. Technical rept. no. 1 on Contract [Nonr]-1181(11). [1962] 19p. 11 refs.

DESCRIPTORS: *Group dynamics, *Nervous system, Stimulation, Man, Brain, *Behavior, Attitudes, *Lipids, Mobilization, *Decision making, Atherosclerosis, Social communication, Adaptation (Physiology).

Nine groups of four subjects each were studied during the task of making an individual judgmental decision in the presence of the group. The characteristics of group cohesiveness and individual ability were created by the experimenters. Central nervous system arousal was measured by changes in plasma FFA levels during periods of the experiment. The conditions of the group interaction did significantly modify the degree of arousal. The degree of conforming behavior exhibited by the individual varied significantly between groups and bore an inverse relationship to arousal response during the initial phases of the study. The implications of these studies for the homeostatic integrity of the organism is discussed. (Author)

AD-281 043 OTS $2.60

Duke U. [Durham, N. C.]
SOCIAL RESEARCH AS A COMMUNICATIONS SYSTEM, by Kurt W. Back. Technical rept. no. 2 on Contract Nonr-1181(11). [1961] 22p. 23 refs.

DESCRIPTORS: *Social communication, Communication systems, *Communication theory, Behavior, *Information theory, Bionics, Statistical data, Sampling, *Nervous system, *Decision making, *Public opinion polls.

This paper discusses several corollaries of the definition of the research process as a communication system and applies these conclusions to specific research processes.

Psychology

AD-281 267 OTS $4.60

Educational Testing Service, Princeton, N. J.
COMMUNICATION RESTRAINTS AND MUTUAL PROBLEM-SOLVING BEHAVIOR, by John K. Hemphill and Carolyn B. McConville. Rept. on Contract Nonr-2959(00). Apr 62, 47p. 3 refs. Technical rept. and Research bull. RB-62-8.

DESCRIPTORS: Inhibition, *Reasoning, Behavior, *Social communication, Motivation, Test construction (Psychology), *Group dynamics, *Decision making.

In most situations, communication among parties involved in a group problem-solving situation is regarded as desirable if not essential, since each member's intentions can be made known and future actions made predictable. The present experiment was designed to test the hypothesis that communication facilitates the development of effective and predictable structure-in-interaction and thus contributes to the effectiveness of the group's problem-solving activities. (Author)

AD-280 688 OTS $1.60

Louisiana State U., Baton Rouge.
RESPONSE TO AUTHORITY AS A FUNCTION OF SEX AND AGE OF CHILD AND SEX OF EXPERIMENTER, by John R. Stabler, John G. Herrmann, and Elizabeth A. Mayer. Technical rept. no. 5 on Leadership and Organizational Behavior Test of a Proposed Theory, Contract [Nonr]-1575(05). Apr 62, 13p. 6 refs.

DESCRIPTORS: *Leadership, *Behavior, Tests, Theory, *Sex, *Age, Children, Reaction (Psychology)

Sixty fourth-grade elementary school children and sixty preschool-age children were divided into eight experimental groups of fifteen Ss each. A procedure was designed to establish a coercive situation in which an adult E ordered a child to do something he preferred not to do. At each age level, one group of male children received the instructions from a male E and another group received the instructions from a female E. The same experimental conditions prevailed for the female children. Compliance was measured by the number of presses of the hand counter after the child had received the instruction to continue pressing. No statistically reliable differences were found among groups at the preschool age level. At the grammar school age level, however, it was found that the male E was more influential with boys. (Author)

AD-288 518 OTS $2.60

Missouir U., Columbia.
PLURALISTIC IGNORANCE IN THE ROLE OF THE TEACHER, by Bruce J. Biddle, Howard A. Rosencranz and others. Technical rept. no. 3 on Contract Nonr-2296(02). Sep 62, 22p. 13 refs.

DESCRIPTORS: *Instructors, *Behavior, *Sociometrics, *Education, Sociology, Group dynamics, Training, Theory, Effectiveness.

A study of the norms and expectations attributed by teachers, parents, pupils, and school officials from the Kansas City metropolitan area to People in General and School Officials was made. It was discovered that respondents attributed conservative, inaccurate, non-veridical norms and expectations to People in General. This stereotype was matched by equally conservative and mistaken norms and expectations attributed to School Officials by all respondents except school officials themselves. The implications of these stereotypes for contemporary education are explored. (Author)

AD-288 543 OTS $2.60

Missouri U., Columbia.
ROLE CONFLICTS FOR PUBLIC SCHOOL TEACHERS, by J. Paschal Twyman and Bruce J. Biddle. Technical rept. no. 4 on Contract Nonr-2296(02). Sep 62, 22p. 9 refs.

DESCRIPTORS: *Instructors, *Behavior, *Sociometrics, Education, Psychology, Group dynamics, Sociology, Theory.

Data reported in this paper have been based on a comparison of cognitions held for selected teacher behaviors by members of four school-related social positions. It seems clear that a number of significant disparities exist among teachers, school officials, parents, and pupils over teacher role cognitions. These disparities were found for positive norms, negative norms and for expectations, and occurred in a variety of content areas.

AD-288 519 OTS $2.60

Missouri U., Columbia.
THE ROLE OF THE TEACHER AND OCCUPATIONAL CHOICE, by Bruce J. Biddle, J. Paschal Twyman, and Earl F. Rankin, Jr. Technical rept. no. 2 on Contract Nonr-2296(02). Sep 62, 27p. 28 refs.

DESCRIPTORS: *Instructors, *Professional personnel, *Attitudes, *Education, Psychology, Sociometrics, Needs, Job analysis, Group dynamics, Personality.

This paper reports an empirical investigation into relationships between the role of the public school teacher and recruitment into the teaching profession. The data was gathered from three groups of respondents: teachers, education students, and non-education students. Results indicate that these groups hold diverse and different norms and expectations for the position of public school teacher. Implications of these findings are explored.

AD-281 302 OTS $3.60

Missouri U., Columbia.
ROLES, GOALS AND VALUE STRUCTURES IN ORGANIZATIONS, by Bruce J. Biddle. Technical rept. no. 1 on Contract Nonr-2296(02). 22 June 62, 36p. 43 refs.

DESCRIPTORS: *Sociometrics, *Sociology, Group dynamics, Education, Behavior, Theory, Psychology, Perception.

The terms role and goal have been used as elements in three, distinct systems of concepts for analysing behavior, and confusion is generated in contemporary research through refusal to recognize the unique characteristics of each system. This thesis is defended through a general discussion of the three systems, through parallel definitions of several terms in the three systems, and through application of the distinctions made to familiar examples of organizations. Many of the distinctions made in this paper were developed originally for role theory.

AD-284 607 OTS $4.60

New York U., N. Y.
ASSOCIATIVE INDICES AS MEASURES OF WORD RELATEDNESS: A SUMMARY AND COMPARISON OF TEN METHODS, by George R. Marshall and Charles N. Cofer. Technical rept. no. 10 on Learning, Retention and Recovery of Meaningful Material, Contract Nonr-285(47). July 62, 42p. 44 refs.

DESCRIPTORS: *Psychology, *Vocabulary, *Verbal behavior, Measurement, Test methods, *Learning, Memory.

This review presents the various indices that have been developed by various investigators to date, describes the norms on which the indices are based, outlines the rationale and exemplifies the methods for computation of the indices, and touches upon the limited related experimental evidence concerning the value of the indices. A second purpose is to forward a rationale for two indices designed by the present authors, outline and give examples of their computation and consider their usefulness in comparison to other indices. Comparisons of indices are made throughout this presentation to help the reader become familiar with the indices and the relevant experimental evidence.

AD-281 306 OTS $2.60

North Carolina State Coll., Raleigh.
CONTEXT EFFECTS IN PAIRED-ASSOCIATE LEARNING AS A FUNCTION OF ELEMENT-SHARING AMONG STIMULUS TERMS, by Slater E. Newman and L. Rogers Taylor. Technical rept. no. 3 on Contract Nonr-486(08). June 62, 21p. 12 refs.

DESCRIPTORS: *Learning, Conditioned reflex, Transfer of training, *Verbal behavior, Reaction (Psychology).

This experiment tested the hypothesis that the tendency for the dominant response in the final hierarchy for a stimulus term to be to its context element(s) is a direct function of the number of primary elements shared by the term with other stimulus terms in the list. The data were interpreted as supporting the hypothesis. Additional effects of element-sharing and of context elements are discussed. (Author)

AD-287 137 OTS $2.60

Ohio State U. Research Foundation, Columbus.
ARTIFICIAL ATMOSPHERES IN SEALED ENVIRONMENTS, by Fred A. Hitchcock, John H. Dines, and Edwin P. Hiatt. Final rept. 1 Sep 59-31 Aug 62, on Contract Nonr-495(19). Sep 62, 26p. 29 refs. RF Proj. 991.

DESCRIPTORS: *Controlled atmospheres, *Respiration, Oxygen, Nitrogen, Air, Metabolism, Urine, Behavior, Physiology, Test facilities, Laboratory animals, *Closed-cycle ecological systems.

Part I deals with the design, construction, and testing of a facility used to investigate the effect of exposing small animals to abnormal gaseous environments for relatively long periods of time. Part II deals with the use of this facility to study the reaction of young, white rats to an atmosphere almost free of nitrogen but with the same partial pressure of oxygen in their lungs as the control animals breathing air.

AD-279 195 OTS $2.60

Princeton U., N. J.
GROUP COMPOSITION EFFECTS ON TEAM ECONOMIC PERFORMANCE, by Keith E. Davis. Rept. on Project SoBig, Contract Nonr-1858(36). Apr 62, 25p. 15 refs.

DESCRIPTORS: *Sociometrics, *Group dynamics, *Leadership, Behavior, Attitudes, *Economics, Decision making.

The present study is an investigation of the group composition issue in the context of a long-term, competitive, economic game.

AD-281 547 OTS $2.60

Research Center for Human Relations, New York U., N. Y.
EFFECTS OF VARIATIONS IN ANXIETY, PERSONAL THREAT AND RACIAL ENVIRONMENT ON TASK PERFORMANCE OF NEGRO COLLEGE STUDENTS, by Irwin Katz and Charles Greenbaum. Technical rept. on Contract Nonr-285(24). Apr 62, 24p. 17 refs.

DESCRIPTORS: *Anxiety, Stress (Psychology), Behavior, Adjustment (Psychology), Students, *Group dynamics, Psychometerics, *Reasoning.

This study dealt with the effect on Negro efficiency of variations in degree of stress, and in the race of other persons in the task situation. Alternative predictions were derived from the Hull-Spence theory of behavior, and from the hypothesis of an inverted U-shaped relation between arousal and performance. The main findings, that (a) performance was better in White-Mild Threat than in Negro-Mild Threat, and (b) Strong Threat, as compared with Mild Threat, was more detrimental to performance in the White Condition than in the Negro Condition, strongly upheld predictions from the U-shape hypothesis. In addition, there was

evidence of an inverted U-shaped relation between MAS scores and first trial performance in the White Condition. Interpretations based on possible differences in the social meaning for Ss of the various experimental conditions were also discussed. (See also PB 159 783)

AD-281 117 OTS $9.60

Texas Christian U., Fort Worth.
SYMPOSIUM ON DIMENSIONS OF STIMULUS SITUATIONS WHICH ACCOUNT FOR BEHAVIOR VARIANCE, 20-22 APRIL 1961, ed. by S. B. Sells. Technical rept. no. 1 on Contract Nonr-3436(00). Apr 62, 117p. 207 refs.

DESCRIPTORS: Stimulation, *Behavior, Perception, Adjustment (Psychology), Inhibition, Group dynamics, Reaction (Psychology), Social communication, Ecology, *Conferences

Contents:
Dimensions of stimulus situations which account for behavior variance, by S. B. Sells, Ph. D.
Toward a taxonomy of social situations, by Roger Bellows, Ph. D.
Design for the study of deterrence, by Thomas W. Milburn, Ph. D.
The effects of others on ego's behavior, by Edgar F. Borgatta, Ph. D.
The specification of the stimulus in a social interaction, by Bernard Mausner, Ph. D.
Experimenting with simulated manufacturing organizations, by Bernard M. Bass, Ph. D.
The specification of a social stimulus, by Malcolm D. Arnoult, Ph. D.
What should be expected of expectation theory? by Ralph M. Stogdill, Ph. D.
Dimensions of group tasks, by John T. Lanzetta, Ph. D.
Stimulus determinants and other sources of variance of behavior, by S. B. Sells, Ph. D.
Formulating the Environmental situation, and its perception in behavior theory, by Raymond B. Cattell, Ph. D. (Presented by Arthur B. Sweney, Ph. D.)
Varieties of social stimulus situations, by Muzafer Sherif, Ph. D., and Carolyn W. Sherif, Ph. D.
Relevance of stimuli and models of task situations, by Norman F. Washburne, Ph. D.
Discussion and summary of designs for research on the taxonomy of situational stimuli influencing behavior, by S. B. Sells, Ph. D.

AD-281 196 OTS $3.60

Texas Christian U. [Fort Worth].
TOWARD A TAXONOMY OF ORGANIZATIONS, by S. B. Sells. Technical rept. no. 2 on Dimensions of Stimulus Situations Which Account for Behavior Variance Contract Nonr-3436(00). June 62, 39p. 25 refs.

DESCRIPTORS: *Taxonomy, *Behavior, Motivation, *Group dynamics, Aptitude tests, Achievement tests, *Personality, Social communication, *Ecology, Adjustment (Psychology)

AD-288 157 OTS $8.60

Training Research Lab., U. of Illinois, Urbana.
CONCEPT FORMATION WITH METRICALLY MULTI-VALUED CUES AND RESPONSE CATEGORIES, by Thomas J. McHale and Lawrence M. Stolurow. Technical rept. no. 3 on Group and Organizational Factors Influencing Creativity, Contract Nonr-1834(36). Apr 62, 99p. 9 refs.

DESCRIPTORS: *Reasoning, Factor analysis, Models (Simulation), *Psychometrics, Learning, *Reaction (Psychology), *Decision making

A concept formation task with metrically multi-valued cues and response categories was used. This task is based on a multiple correlational model, with which it is possible to detect the emergence of a mediating construct which combines the weighted values of primary cues into a conjunctive concept. A set of five working hypotheses was developed concerning the choice of cues and the levels of performance of the subjects.

AD-280 250 OTS $6.60

Vanderbilt U. [Nashville, Tenn.]
STUDIES IN ABSTRACTION LEARNING: VI. THE EFFECTS OF INSTRUCTIONAL SET, by Stanford C. Ericksen. Technical rept. no. 8 on Contract Nonr-2149(01). Apr 62, 66p. 25 refs.

DESCRIPTORS: *Learning, Reasoning, Applied psychology, Theory, Tests, Sensory perception, Group dynamics, Psychology, Training, *Transfer of training.

Two methods have been used to induce the desired set in the walking maze subjects, but only one of these methods is equally appropriate for both the perception-set and the abstraction-set: to provide the subject, before he starts to learn, with formal verbal instructions which clearly point out to the abstraction learning subjects the advantages of their attending to the temporal and directional relations, rather than the spatial characteristics of the maze. The Perception-set subjects are encouraged to associate the sequence of treadle positions with the several distinct features in the maze room. The present study is designed to test whether this method can be effective in establishing a controlling set with the subjects in the two experimental groups. (See also AD-262 130)

BIOLOGICAL SCIENCES

TID-15316 OTS $1.60

Argonne National Lab., Ill.
THE SPECIFIC DETERMINATION OF VITAMIN A AND OTHER CAROTENOIDS IN THE PRESENCE OF ONE ANOTHER, by Richard E. Dugan, Norman A. Frigerio, and John M. Siebert. Rept. on Contract W31-109-eng-38. Dec 61, 13p. 7 refs. UAC-6014.

TID-17226 OTS $2.75

Atomic Energy Commission, Washington, D. C.
BIOENVIRONMENTAL FEATURES OF THE OGOTORUK CREEK AREA, CAPE THOMPSON, ALASKA, ed. by Bette Weichold. Oct 62. 193p. 72 refs.

Including Predictions and Assessments of the Effects of Nuclear Detonations Proposed for an Excavation Experiment. A Second Summary Compiled by the Committee on Environmental Studies for Project Chariot.

PB 162 868 OTS $1.10

California U., Los Angeles, School of Medicine.
TWO FOOD DISPENSERS FOR PREVENTING THE SPREAD OF INTERNAL PARASITES IN LABORATORY RATS, by Fae D. Wood. [1962] 9p. 3 refs.

DESCRIPTORS: *Food, *Dispensers, Inhibition, *Parasitic infections, *Laboratory animals, Rats, Laboratory equipment, Contamination.

Directions for constructing the feeders and evidences of their effectiveness are given.

AD-279 347 OTS $1.10

Narragansett Marine Lab., U. of Rhode Island, Kingston.
BIOLOGICAL PRODUCTIVITY PROJECT, by David M. Pratt. Annual progress rept. 1 Jan-31 Dec 61, on Contract Nonr-396(03). Feb 62, 5p. Ref. no. 62-1.

DESCRIPTORS: *Marine biology, *Ecology, *Plankton, *Bacteria, Crustacea, Algae, Estuaries, Production, Naragansett Bay.

Summaries are given of investigations of phytoplankton abundance, ecological significance of marine bacteria, and epibenthos. (See also PB 159 421)

Anatomy and Physiology

AD-294 836 repriced OTS $0.50

Arctic Aeromedical Lab., Fort Wainwright, Alaska.
ARCTIC SURVIVAL RATIONS. IX. EFFECT OF A HIGH FAT DIET ON THIAMINE EXCRETION AND PLASMA CHOLESTEROL IN HUMAN SUBJECTS, by D. A. Vaughan, L. N. Vaughan and others. July 62, 10p. 10 refs. Technical documentary rept. AAL TDR-62-28.

DESCRIPTORS: Diet, *Fats, *Vitamin B complex, *Cholesterol, Excretion, *Survival, Man, Military rations, *Arctic regions

Human subjects were used to test the effects of two simple diets of varying fat content on thiamine excretion, plasma cholesterol, ketone excretion and the oxygen cost of exercise. After subsistence on the high diet (60% of Calories) for two weeks, the subjects basal excretion of thiamine and their load dose returns of urinary thiamine were significantly less than on the low fat diet (18% of Calories). This was considered to be evidence that a high fat diet has a sparing effect on the thiamine requirement of humans. In the 2-week period plasma cholesterol levels were significantly increased by subsistence on the low fat diet; no change was observed when the subjects ate the high fat diet. These effects were attributed to the predominately saturated nature of the fat in the low-fat diet, in contrast to the high fat diet in which 69% of the fat was unsaturated corn oil. No changes were observed in ketone excretion or in the oxygen cost of exercise during these experimental periods. (Author) (See also AD-261 237)

AD-294 793 repriced OTS $0.75

Arctic Aeromedical Lab., Fort Wainwright, Alaska.
PHYSICAL INSULATION OF KOREAN DIVING WOMEN, by D. W. Rennie, B. G. Covino (Buffalo U. School of Medicine) and others. Rept. on Contract AF 41(657)302 and NSF Grant G-8794. July 62, 23p. 15 refs. Technical documentary rept. AAL TDR-62-22.

DESCRIPTORS: *Body fats, *Body temperature, Korea, *Women, *Diving, *Exposure, Perception, Adaptation (Physiology), Shivering, Metabolism.

Human cold adaptation was studied by comparing maximal body insulations (I values) of Korean diving women, non-diving women and men, and of American men and women. The diving women had significantly larger I values than Korean men, due to thicker subcutaneous fat. There was no difference in I value or subcutaneous fat thickness between the diving women and the non-diving women. The Koreans had 30 per cent higher I values than Americans of comparable subcutaneous fat thickness, signifying greater vasoconstriction and a thicker shell of non-perfused tissue. The "critical water temperature" at which shivering occurred was 30° C or lower for the diving women. For other subjects of comparable fat thickness it was 31° to 34° C. This elevated shivering threshold of the diving women was the only evidence of acquired cold adaptation. The thicker subcutaneous fat of women offers more protection to cold and may be the reason why women and not men engage in diving. (Author)

AD-294 800 repriced OTS $0.50

Arctic Aeromedical Lab., Fort Wainwright, Alaska.
THE POST COLD BEHAVIOR OF RIBOFLAVIN DEFICIENT RATS, by D. A. Vaughan, L. N. Vaughan, and G. J. Klain. July 62, 14p. 7 refs. Technical documentary rept. AAL TDR-62-27.

DESCRIPTORS: *Behavior, Rats, *Deficiency diseases, *Vitamin B complex, *Exposure, Xanthine oxidase

The post-cold behavior of riboflavin-deficient rats was studied. It was observed that rats depleted at 5° C for four weeks resumed slow growth (due to fat and water deposition) upon return to 25° C. Gross symptoms of the deficiency did not appear as soon in the post-cold rats as in the warm rats. Total riboflavin losses from the liver were rapid initially, leveling out at about one-third of normal concentration, but there was little difference between groups. Liver and kidney xanthine oxidase activity did not fall as rapidly as did riboflavin, and the post-cold rats appear to maintain higher levels throughout the experiment. (Author)

NASA N63-12703 OTS $0.75

Langley Research Center, National Aeronautics and Space Administration, Langley Station, Va.
INVESTIGATION OF THE VISUAL BOUNDARY FOR IMMEDIATE PERCEPTION OF VERTICAL RATE OF DESCENT, by Lindsay J. Lina and Arthur Assadourian. Feb 63, 24p. 1 ref. Technical note D-1591

AD-294 834 repriced OTS $1.00

Pennsylvania U. School of Medicine, Philadelphia.
THERMAL AND METABOLIC MEASUREMENTS ON A REINDEER AT REST AND IN EXERCISE, by H. T. Hammel, T. R. Houpt and others. Rept. on Contract AF 41(657)284. June 62, 39p. 9 refs. Technical documentary rept. AAL TDR-61-54.

DESCRIPTORS: Measurement, *Body temperature, *Metabolism, *Exercise, *Arctic regions, *Heat production (Biology), Exposure, Adaptation (Physiology), *Mammals, Fur.

Adaptations which equip a mammal to cope with the cold stresses of the Arctic environment must at the same time be accompanied by responses which enable it to dissipate large quantities of heat produced during exercise. Some aspects of the heat producing and heat dissipating mechanisms were investigated in the reindeer, an example of a large well adapted Arctic mammal. (Author)

AD-288 475 OTS $1.60

Stanford U. School of Medicine, Calif.
BLOOD VOLUMES AND HEART WEIGHTS IN TWO STRAINS OF RAT DURING ADAPTATION TO A NATURAL ALTITUDE OF 12,470 FEET, by George A. Feigen and Paul K. Johnson. Rept. on Contract [No]nr-225(46). [1962] 17p. 12 refs.

DESCRIPTORS: *Blood volume, Laboratory animals, Rats, *Heart, *Weight, Survival, *High altitude, Adaptation (Physiology)

AD-288 476 OTS $2.60

Stanford U. School of Medicine, Calif.
GROWTH RATE AND BLOOD VOLUME IN TWO STRAINS OF RAT AT A NATURAL ALTITUDE OF 12,470 FEET, by Paul K. Johnson and George A. Feigen. Rept. on Contract [No]nr-225(46). [1962] 29p. 29 refs.

DESCRIPTORS: Growth, *Blood volume, *High altitude, *Adaptation (Physiology), Rats, Physiology.

Botany

BNL-6466 OTS $1.60

Brookhaven National Lab., Upton, N. Y.
PROGENY TEST FROM A PITCH PINE-OAK FOREST, DAMAGED BY LOW LEVEL CHRONIC GAMMA RADIATION, by Francois Mergen and G. R. Stairs (Yale U.). Rept. on Contract AT(30-1)2755. 3 Dec 62, 12p.

BNL-6467 OTS $2.60

Brookhaven National Lab., Upton, N. Y.
CUMULATIVE RADIATION EFFECTS ON SEXUAL REPRODUCTION IN PINE AND OAK, by Francois Mergen and G. R. Stairs. (Yale U.). Rept. on Contract AT(30-1)2755. 3 Dec 62, 29p. 7 refs.

Pathology

AD-294 448 repriced OTS $0.75

American Foundation for Biological Research, Madison, Wis.
OBSERVATIONS ON THE EXTENT OF THE INJURY CAUSED BY THE FORMATION OF ICE IN THE FEET OF MICE, by B. J. Luyet and R. J. Williams. Rept. on Contract AF 41(657)343. June 62, 21p. 4 refs. Technical documentary rept. AAL TDR-62-8.

DESCRIPTORS: Injuries, *Exposure, Tissue (Biology), *Mice, *Feet, Freezing, *Arteries, *Necrosis.

This investigation was prompted by the reports of Smith and Lovelock that hamsters may recover fully after a considerable part of their water has been transformed into ice. The present study is limited in scope to the determination of the damage suffered by the feet of mice after freezing at -4°, -6°, -8° or -10° C and subsequent exposure at those temperatures for 10, 30 or 60 minutes. The results, as evaluated after a recovery period of 7 to 10 days, were: (1) Exposure of a foot for 30 minutes or 1 hour, in the frozen state, at 10° and -8° C caused the destruction of the toes and often of a portion of the paw; (2) exposure for as much as one hour at -4° C or for 10 minutes at any of the temperatures mentioned did not prevent an apparently complete recovery; and (3) exposure for 30 to 60 minutes at -6°C resulted in a partial destruction of the toes. When the paw was destroyed (at -8° or -10°, for one hour), the amount of ice present was found to have reached approximately 48 per cent of the weight. In cases of lesser injury, at higher temperatures and/or for shorter exposure times, sufficient information is not yet available to correlate the injury produced with the quantity of ice formed. (Author)

AD-294 815 repriced OTS $0.75

Utah U. Coll. of Medicine, Salt Lake City.
EFFECT OF LOW AMBIENT TEMPERATURES ON SPECIFIC AND NONSPECIFIC RESISTANCE OF MICE TO BACTERIAL DISEASE, by S. Marcus, F. Miya and others. Rept. on Contract AF 41(657)311. Aug 62, 25p. 33 refs. Technical documentary rept. AAL TDR-62-5.

DESCRIPTORS: *Immunity, *Exposure, *Bacteria, Communicable diseases, *Mice, Zymosan, Klebsiella, Pneumonia, Staphylococcus, Escherichia.

Experiments were designed to compare specific and nonspecific resistance to induced bacterial disease in mice placed at 2° C. The animals were acclimatized or unacclimatized to the low temperature. It was found that specific resistance afforded the maximal protection possible whereas nonspecific resistance was of relatively low extent. The low ambient temperature did not interfere with protection gained from specific immunization provided the cold-exposed mice were caged in small groups (10 per group) as compared to individually caged animals. The difference in results between isolated and grouped animals was not due to conservation of heat by huddling. It appears that the effect of isolation contributes to enhanced mortality following challenge. (Author)

Radiobiology

TID-12753 OTS $1.60

Argonne National Lab., Ill.
SKELETAL RETENTION OF THE ALKALINE EARTH RADIOISOTOPES AND BONE DOSIMETRY, by R. E. Rowland. Rept. on Contract W31-109-eng-38. Mar 61, 19p. 10 refs. UAC-5096.

TID-16796 OTS $3.60

Argonne National Lab., Ill.
THE TOXICITY OF RADIOSTRONTIUM, by Miriam P. Finkel and Birute O. Biskis. Rept. on Contract W31-109-eng-38. July 62, 39p. UAC-6674.

BNL-5635 $4.60

Brookhaven National Lab., Upton, N. Y.
THE INACTIVATION OF TRYSIN BY ULTRAVIOLET LIGHT. II. THE CORRELATION OF INACTIVATION WITH THE DISRUPTION OF CONSTITUENT CYSTINE, by L. G. Augenstine and C. A. Ghiron. 1961, 40p. 59 refs.

TID-6875 OTS $1.10

Cancer Research Inst., New England Deaconess Hospital, Boston, Mass.
PITUITARY CHANGES IN PARABIOSED AND IRRADIATED RATS, by Shields Warren and Tamaki Imai. Rept. on Contract AT(30-1)901. [1959] 4p. 2 refs.

PB 162 859 OTS $1.60

Naval School of Aviation Medicine, Penascola, Fla.
SURVIVAL OF ANIMALS IN MAGNETIC FIELDS OF 120,000 GAUSS, by Dietrich E. Beischer. Research rept. 25 July 62, 14p. 9 refs. Bureau of Medicine and Surgery Proj. MR005.13-9010 Subtask 1, rept. no. 6; NASA Order R-39; NASA N62-15553.

DESCRIPTORS: *Animals, Survival, *Magnetic fields, Exposure, *Radiation effects, Biology, Drosophilidae, Bacteria.

A variety of biological material was exposed to strong magnetic fields in a one-inch solenoid of the Naval Research Laboratory, Washington, D. C. Mice survived exposure of one hour to a homogeneous field of 120,000 gauss and also to an inhomogeneous field with a gradient of 7,000 gauss/cm. Drosophila survived in very strong homogeneous fields, but inhomogeneous fields with high field gradients had lethal effects. Photobacterium fischeri and sea urchin eggs were also investigated. The significance of the observations is discussed with reference to biomagnetic effects in general. (Author)

TID-16430 OTS $1.10

Turku U. (Finland)
MUTATION RATES AT SPECIFIC LOCI IN DROSOPHILA MELANOGASTER, by Aloha Hannah-Alava. Rept. for 1 Nov 61-Apr 62 on Contract IAEA 31/US. 1962. 7p.

PB 162 888 OTS $9.60

USAF Radiation Lab., U. of Chicago, Ill.
QUARTERLY PROGRESS REPT. NO. 11, Rept. on Contract AF 33(038)27353. 15 Apr 54, 112p. 91 refs. AD-37 852.

DESCRIPTORS: *Radioprotective agents, Biological assay, *Enzymes, Propyl radicals, *Phenones, *Cysteine, Thio radicals, Ethyl radicals, *Amines, *Spleen, *Thymus gland, *Blood forming organs, Nucleotides, Adenosine phosphates, *X-rays, Radiation effects, *Phosphatases, Metabolism, *Respiration, Succinic acids, *Dehydrogenases, Esters, Acetylcholinesterase, *Cytochrome oxidase, *Pyruvates, *Fumaric acids, Oxidation, *Parasympathomimetic agents, *Muscle relaxants, *Phosphorus transferases, *Amoeba, Cells (Biology), Hydrogen, Ethylenes, Nitrogen compounds, Oxides, Rats, Mice.

Contents:
Studies on the additive effects of combinations of p aminopropiophenone, cysteine, and β-mercaptoethylamine on the 5-nucleotidase activity of spleens and thymus glands of irradiated rats
Application of adenosine triphosphatase assays on hematopoietic tissues for measuring the influence of combinations of prophylactic agents against radiation injury in mammals
Effects of acute x-irradiation on the phosphatases of mouse tissues
Studies on the metabolism of hematopoietic tissues of irradiated animals
Studies on the effects of x-irradiation on the enzymatic hydrolysis of acetylcholine and other esters by animal tissues
Effect of high level x-irradiation on enzymatic reactions
Effect of cholinergic agents on the lethality of x-irradiation in rats
Effect of the administration of muscle relaxants to mice following whole body irradiation
Effect of x-irradiation on hexokinase in rat tissues
Therapeutic effects of nonirradiated protoplasm in x-irradiated giant amoebae following microinjection
Effect of H, ethylene, and N_2O inhalation on the survival time of x-irradiated mice
Studies on the adenosine nucleotide levels of hematopoietic tissues of irradiated animals
Screening of various chemical agents for prophylactic or therapeutic effects against radiation mortality in mice

CHEMISTRY

AD-281 472 OTS $1.10

Directorate of Materials and Processes, Aeronautical Systems Div., Wright-Patterson AFB, Ohio.
RAPID METHOD FOR THE MICRO DETERMINATION OF PHOSPHORUS IN ORGANIC COMPOUNDS, by H. M. Rosenberg and T. M. Downer. Rept. for 1 July-31 Dec 61, on Materials Analyses Evaluation Techniques. Feb 62, 9p. 3 refs. ASD-TDR-62-226; NASA N62-11697.

DESCRIPTORS: *Phosphorus, *Organic compounds, *Microanalysis, Volumetric analysis, Chemical indicators, Cerium, Determination.

This report contains an evaluation of a rapid volumetric procedure for the micro determination of phosphorus in organic compounds. The method is based on combusting the sample in a Schöniger flask followed by titration with cerous solution, using Eriochrome Black T as the indicator. (Author)

IS-423 OTS $1.60

Institute for Atomic Research, Iowa State U. of Science and Tech., Ames.
SEPARATION OF IRON BY LIQUID-LIQUID COLUMN EXTRACTION, by James S. Fritz and C. E. Hedrick. Rept. on Contract W7405-eng-82. 21 Mar 62, 18p. 9 refs.

Inorganic Chemistry

IS-287 OTS $1.10

Ames Lab., Iowa State U. of Science and Tech.
ELECTRON DEFICIENT COMPOUNDS. IX. THE STRUCTURE OF STANNOUS CHLORIDE, by R. E. Rundle and D. H. Olson. Rept. on Contract W7405-eng-82. 14 Apr 61. 7p. 8 refs.

AD-279 328 OTS $1.10

North Carolina U., Chapel Hill.
THE PREPARATION OF $MoCl_4 \cdot 4(C_6H_5)_3AsO$, by Sally M. Horner and S. Y. Tyree. Technical rept. no. on Contract Nonr-855(05). 10 Mar 62, 6p. 9 refs.

DESCRIPTORS: *Complex compounds, *Molybdenum compounds, *Chlorides, *Phenyl radicals, *Arsines, *Oxides, Preparation, Magnetic susceptibility, Electrical conductance, Spectra (Infrared).

The compound $MoCl_4 \cdot 4(C_6H_5)_3AsO$ has been prepared by reacting $MoCl_4$ with $(C_6H_5)_3AsO$ in CCl_4 solvent. The compound is white, diamagnetic, and another in the small list of octacoordinate Mo(IV) complexes. (Author)

AD-281 548 OTS $1.10

Pennsalt Chemicals Corp., Wyndmoor, Pa.
POLY[DI-μ-DIPHENYLPHOSPHINATO-ACETYL-ACETONATOCHROMIUM(III)]. A COORDINATION POLYMER WITH AN INORGANIC BACKBONE, by B. P. Block, Joseph Simkin, and L. R. Ocone. Technical rept. no. 29 on Contract Nonr-2687(00). Apr 62, 6p. 14 refs.

DESCRIPTORS: *Complex compounds, *Chromium compounds, *Phenyl radicals, *Phosphines, *Acetones, Preparation, Molecular structure, Chemical analysis, Chelate compounds.

AD-279 562 OTS $1.60

Tulane U., New Orleans, La.
MIXED COMPLEXES OF COPPER(II) WITH o-AZOPHENOL AND ETHANOLAMINE OR ETHYLENEDIAMINE, by Elwood J. Gonzales and Hans B. Jonassen. Technical rept. no. 2 on Contract Nonr-47509. 16 Apr 62, 11p. 12 refs.

DESCRIPTORS: *Complex compounds, *Copper compounds, Nitrogen compounds, *Phenols, *Ethanols, *Ethylenes, *Amines, Preparation, Spectrographic analysis, Electrical conductance, Magnetic susceptibility.

The copper(II) ion is known to form a 1:1 complex with o-o'dihydroxy azobenzene (abbrev. dye). This complex reacts with ethylenediamine (abbrev. en) or ethanolamine (abbrev. em) to form a 1:1 complex [Cu-dye-en] or [Cu-dye-em] respectively where the copper(II) ion seemingly has a coordination number of five. The solid [Cu-dye-em] complex on the other hand is a dimer with a magnetic moment of 1.3 B.M. Hydrogen bonding seems to contribute to dimer stabilization. (Author)

AD-289 292 OTS $1.60

Washington U., Seattle.
REACTIONS OF THE HALOGEN FLUOROSULFATES, $FOSO_2F$, $ClOSO_2F$, $BrOSO_2F$ AND $Br(OSO_2F)_3$, by William P. Gilbreath and George H. Cady. Technical rept. no. 38 on Contract Nonr-477(16). 1962, 16p. 11 refs. ARPA Order no. 26-60, Task 2, Item 3.

DESCRIPTORS: *Fluorides, *Sulfates, *Halogen compounds, Chlorine compounds, Fluorine compounds, Bromine compounds, Chemical reactions, Ethylenes, Nuclear magnetic resonance, Infrared spectroscopy, Mass spectroscopy.

The new reactive compound, chlorine fluorosulfate, $ClOSO_2F$, was produced by the combination of chlorine with peroxydisulfuryl difluoride, $S_2O_6F_2$, at about 125° under pressure. It combined with tetrafluoroethylene to form 2-chlorotetrafluoroethyl fluorosulfate. This type of behavior was found to be typical of the halogen (I) fluorosulfates of fluorine, chlorine and bromine. They were added across the carbon-carbon double bond to bind the halogen atom to one of the carbon atoms and the fluorosulfate group to the other.

AD-285 205 OTS $2.60

Washington U., Seattle.
SULFUR BROMIDE PENTAFLUORIDE [AND] PREPARATION AND PROPERTIES OF DIFLUOROFLUOROSULFATOAMINE NF_2OSO_2F, by Claude I. Merrill, Max Lustig, and George H. Cady. Technical rept. 36 and 37 on Contract Nonr-477(16). 1962, 25p. 29 refs. ARPA Order no. 26-60.

DESCRIPTORS: *Sulfur compounds, *Fluorides, *Amines, *Bromides, Sulfonyl radicals, Oxygen compounds, Bromine, Hydrazines, Reaction kinetics, Physical properties, Chemical properties, Decomposition, Photolysis, Infrared spectroscopy, Ultraviolet radiation, Nuclear magnetic resonance, Synthesis.

Sulfur bromide pentafluoride has been prepared in a reaction between bromine, bromine pentafluoride and sulfur tetrafluoride at 100° under autogenous pressure in a Monel tube. The compound boils at 3.1° and in the liquid state has a faintly yellow color. It decomposes above 150°, undergoes hydrolysis at room temperature, adds readily to ethylene and in general behaves as a reactive substance. (Author)

Organic Chemistry

TID-17239 OTS $1.60

Georgia Inst. of Tech. Engineering Experiment Station, Atlanta.
PHYSICAL PROPERTIES AND STRUCTURAL CHARACTERISTICS OF POLYMERS RESULTING FROM "POST-EFFECT" POLYMERIZATION, by L. W. Elston and W. H. Burrows. Quarterly technical status rept. no. 2, 1 June-30 Aug 62, on Contract AT(38-1)202. 10 Sep 62, 13p. 3 refs.

AD-284 613 OTS $2.60

Tulane U., New Orleans, La.
IMPORTANCE OF DELTA-BONDING IN INORGANIC COORDINATION COMPOUNDS, by Hans B. Jonassen and Jukka Kyrki. Status rept. no. 5 on Contract Nonr-47509. 15 July 62, 24p. 14 refs.

DESCRIPTORS: Inorganic substances, *Complex compounds, *Chemical bonds, *Quinolines, *Halides, Hydroxides, Chlorides, Bromides, *Copper compounds, *Lithium compounds, Acetates, Synthesis, Stability, Physical properties, Single crystals, Preparation.

The past half a year has been primarily spent attempting to determine the stability constants of the copper(II)-8-hydroxyquinoline-chloride and bromide complexes; determining conditions essential for the precipitation of the different forms of copper(II)-8-hydroxyquinolates and, using this information, preparing better single crystals for x-ray studies; and studying the interaction of copper(II)-acetate with 8-hydroxyquinoline with the aim to prepare the mixed complex copper(II)-8-hydroxyquinoline-acetate. Using copper(II)-8-hydroxyquinoline-bromide and lithium acetate in water a new copper complex has been prepared. A study of its properties has been started. (Author)

Physical Chemistry

AD-279 842 OTS $1.60

Calvin Coll., Grand Rapids, Mich.
THE DISSOLUTION OF SILVER OXIDES IN ALKALINE SOLUTIONS, by Thedford P. Dirkse, Leonard A. Vander Lugt, and Harold Schnyders. Technical rept. no. 4 on Contract Nonr-1682(01). 1 Apr 62, 14p. 8 refs.

DESCRIPTORS: *Electrochemistry, *Silver electrodes, Silver compounds, *Oxides, Solubility, Reduction, Electric potential, Potassium compounds, Hydroxides.

The dissolution of AgO in 1 N KOH has been followed by determining its solubility and by observing the changes in potential of a silver electrode in such solutions. It is concluded that AgO does dissolve readily in KOH solutions, but then is reduced by the water to a form of monovalent silver. (Author)

TID-16694 OTS $2.60

Georgia Inst. of Tech. Engineering Experiment Station, Atlanta.
EFFECTS OF HIGH DENSITY IONIZING RADIATION ON COLLOIDAL SYSTEMS AND SUSPENSIONS, by Werner N. Grune, Walter H. Burrows, and Clyde Orr, Jr. Quarterly technical status rept. no. 1, 1 Mar-30 May 62, on Contract AT(38-1)202. 22 June 62, 22p. 62 refs.

MATT-148 OTS $0.75

Plasma Physics Lab., Princeton U., N. J.
DETERMINATION OF DIFFUSIVITY AND SOLUBILITY IN TWO PHASE SYSTEMS, by F. W. Camp and E. F. Johnson. Rept. on Contract AT(30-1)1238. Sep 62. 35p. NASA N63-12102.

AD-280 322 OTS $3.60

Washington U., Seattle.
LARGE SECONDARY INTERMOLECULAR KINETIC ISOTOPE EFFECTS IN NON-EQUILIBRIUM SYSTEMS. ENERGIZATION BY CHEMICAL ACTIVATION [AND] THE UNIMOLECULAR DECOMPOSITION OF CHEMICALLY ACTIVATED sec-BUTYL AND sec-BUTYL-d RADICALS. REACTION OF H AND D WITH trans-BUTENE-2 AND BUTENE-1, by J. W. Simons, B. S. Rabinovitch and others. Technical rept. no. 9 on Contract Nonr-477(14). 20 Apr 62, 38p. 41 refs.

DESCRIPTORS: *Butenes, Hydrogen, *Deuterium, Chemical reactions, *Butyl radicals, Methyl radicals, Butenyl radicals, Pentanes, Pentenes, Isotopes, Reaction kinetics.

AD-290 362 OTS $8.10

Westinghouse Research Labs., Pittsburgh, Pa.
TRANSPORT STUDIES OF DEFECT STRUCTURE IN-ORGANIC COMPOUNDS, by R. J. Ruka. Semiannual technical rept. 1 Apr-30 Sep 62, on Contract Nonr-38 Contract Nonr-3800(00). [1962] 87p. 37 refs. ARPA Order no. 300-62.

DESCRIPTORS: Inorganic substances, *Calcium compounds, *Zirconium compounds, Oxides, *Yttrium compounds, *Thorium compounds, *Crystal growth, *Thermoelectricity, Power supplies, Electrolytes, Chemical impurities, Conductivity, Electrolytic cells, Heat of reaction, Electrodes, *Fuel cells, Thermodynamics, Diffusion, Solutions, Lattices, X-ray diffraction analysis, Transport properties.

Contents:
Grain growth of $Ca_{0.16}Zr_{0.84}O_{1.84}$ by T. Y. Tien and E. C. Subbarao
Thermoelectric power of solid electrolyte thermo-cells, by L. J. Dykstra
Localized heat evolution from electrode reactions in a solid electrolyte type of fuel cell, by L. J. Dykstra
Measurement of the Seebeck coefficient of a $(ZrO_2)_{.85}(CaO)_{.15}$ electrolyte thermocell, by J. Bauerle and R. Ruka
A procedure for measuring yttrium diffusion in the ThO_2-$YO_{1.5}$ system by P. H. Sutter and E. C. Subbarao

IS-438 OTS $1.10

Institute for Atomic Research, Iowa State U. of Science and Tech., Ames.
THE ABSOLUTE ABUNDANCE OF THE CHROMIUM ISOTOPES IN SOME SECONDARY MINERALS, by H. J. Svec, G. D. Flesch, and J. Capellen. Rept. on Contract W7405-eng-82. 1962, 8p. 1 ref.

AD-279 271 OTS $10.50

Pacific Science Board, National Research Council, Washington, D. C.
GEOGRAPHY AND LAND ECOLOGY OF CLIPPERTON ISLAND, by Marie-Helene Sachet. Rept. on Contract N7onr-2300(12). 28 Feb 62, 139p. 160 refs. Atoll Research bull. no. 86.

DESCRIPTORS: *Pacific islands, *Geography, *Ecology, *Climatology, Atmospheric temperature, Barometric pressure, Wind, Storms, Humidity, Clouds, Visibility, *Oceanography, Ocean currents, Ocean waves, Tides, Temperature, *Ocean bottom topography, Marine geology, Mountains, Reefs, *Terrain, Beaches, *Petrology, Rock, Soils, Sedimentation, *Geology, History, *Plants, *Animals, Mammals, Birds, Reptiles, Fishes, Mollusca, Arthropods.

Geography

AD-280 997 OTS $1.60

Columbia U., New York.
THE PORT OF ZIGUINCHOR: THE DIRECT OCEAN OUTLET FOR CASAMANCE (SENEGAL), by Richard J. Peterec. Rept. on Contract Nonr-266(29). [1962] 20p. 14 refs. Technical rept. Cu 20-62-Nonr 266(29) Geog.

DESCRIPTORS: *Harbors, Rivers, *French West Africa, Commerce, Agriculture, Economics, Urban areas, Culture, *Geography.

AD-281 458 OTS $2.60

Columbia U., New York.
THE POSITION OF KAOLACK (SENEGAL) AND OTHER PORTS OF THE SALOUM ESTUARY IN WEST AFRICAN TRADE, by Peter J. Peterec (Bucknell U.). Rept. on Contract Nonr-266(29). 27p. 15 refs. Technical rept. Cu 21-62 Nonr 266(29) Geog.

DESCRIPTORS: *Harbors, Estuaries, *French West Africa, *Commerce, Navigation, Industries, Transportation, Agriculture, Economics, *Geography.

AD-280 996 OTS $2.60

Columbia U., New York.
SAINT-LOUIS-DU-SÉNÉGAL: THE NATURAL OCEAN OUTLET FOR THE SENEGAL RIVER VALLEY, by Richard L. Peterec (Bucknell U.). Rept. on Contract Nonr-266(29). [1962] 29p. 25 refs. Technical rept. Cu 19-62-Nonr 266(29) Geog.

DESCRIPTORS: Africa, *Harbors, *Transportation, *Commerce, Geography, *Rivers, Drainage, Urban areas, Tables, Agriculture, *French West Africa.

AD-281 045 OTS $5.60

Montana State U., Missoula.
A STUDY OF GEOMORPHIC CHANGES IN EARTHQUAKE FEATURES, HEBGEN LAKE, MONTANA, by Marie Morisawa. Final rept. on Contract Nonr-3254(00). 1962, 56p. 13 refs.

DESCRIPTORS: Geography, *Earthquakes, Geology, Climatology, *Erosion, *Drainage, Soils, *Montana, Tables.

Analysis of data obtained at scarp stations indicates that ground slope, clay-silt content, and scarp height exert a control on scarp retreat. Free fall of material and sliding forward of blocks have resulted in obscurity of the original front. Changes on the face have occurred rapidly in two years and it is felt that the scarps will soon be stabilized and, in many cases, healed. Knickpoints, created where scarps crossed streams, migrated primarily in response to water volume. Disappearance takes place by removal of material with immediate deposition downstream, and by retreat of the knick upstream. Drainage nets have developed on the uplifted beach. The manner and rate of development, as well as the morphology of the streams, depends upon the initial surface slope and type of material. The network is established almost immediately, later changes being merely an elaboration of the original pattern. Expansion and integration occur simultaneously in different parts of the basin, indicating a state of equilibrium in the system. (Author)

AD-290 370 OTS $2.60

Chesapeake Bay Inst., Johns Hopkins U. [Annapolis, Md.]
BAY CRUISE XIV: 23 JULY-26 July 1957, by D. W. Pritchard. Rept. on Contract Nonr-248(20). July 62, 25p. 1 ref. Data rept. 33; Reference 62-1.

DESCRIPTORS: *Oceanographical data, Meteorological data, Physical properties, Geography, Temperature, Density, Chemical properties, Sea water, Salinity, Tables, *Chesapeake Bay.

AD-290 371 OTS $6.60

Chesapeake Bay Inst., Johns Hopkins U., [Annapolis, Md.]
BAY CRUISE XV: SEPTEMBER 11-20, 1957, by D. W. Pritchard. Rept. on Contract Nonr-248(20). July 62, 61p. 2 refs. Data rept. 34; Reference 62-2.

DESCRIPTORS: *Oceanographical data, *Estuaries, Meteorological data, Physical properties, Geography, Temperature, Density, Chemical properties, Sea water, Salinity, Tables, *Chesapeake Bay.

(See also AD-290 370)

AD-290 372 OTS $3.60

Chesapeake Bay Inst., Johns Hopkins U., [Annapolis, Md.]
BAY CRUISE XVI: 23 JANUARY-7 FEBRUARY 1958, by D. W. Pritchard. Rept. on Contract Nonr-248(20). July 62, 40p. 2 refs. Data rept. 35; Reference 62-3.

DESCRIPTORS: *Oceanographical data, Meteorological data, Physical properties, Geography, Temperature, Density, Chemical properties, Sea water, Salinity, Tables, *Chesapeake Bay.

(See also AD-290 371)

AD-290 373 OTS $7.60

Chesapeake Bay Inst., Johns Hopkins U., [Annapolis, Md.]
BAY CRUISE XVII: 22 APRIL-13 MAY 1958, by D. W. Pritchard. Rept. on Contract Nonr-248(20). July 62, 75p. 2 refs. Data rept. 36; Reference 62-4.

DESCRIPTORS: *Oceanographical data, Meteorological data, Physical properties, Geography, Temperature, Density, Chemical properties, Sea water, Salinity, *Chesapeake Bay.

(See also AD-290 372)

AD-290 375 OTS $4.60

Chesapeake Bay Inst., Johns Hopkins U., [Annapolis, Md.]
BAY CRUISE XVIII: 6 AUGUST-22 AUGUST 1958, by D. W. Pritchard. Rept. on Contract Nonr-248(20). July 62, 50p. Data rept. 38; Reference 62-6..

DESCRIPTORS: *Oceanographical data, *Estuaries, Meteorological data, Physical properties, Geography, Temperature, Density, Chemical properties, Sea water Salinity, Tables, *Chesapeake Bay.

(See also AD-290 373)

AD-290 376 OTS $2.60

Chesapeake Bay Inst., Johns Hopkins U., [Annapolis, Md.]
BAY CRUISE XIX: 4 NOVEMBER-11 DECEMBER 1958, by D. W. Pritchard. Rept. on Contract Nonr-248(20). Jul 62, 25p. Data rept. 39; Reference 62-7.

DESCRIPTORS: .*Oceanographical data, *Estuaries, Meteorological data, Physical properties, Geography, Temperature, Density, Chemical properties, Sea water, Salinity, Tables, *Chesapeake Bay.

(See also AD-290 375)

AD-290 377 OTS $6.60

Chesapeake Bay Inst., Johns Hopkins U. [Annapolis, Md.]
BAY CRUISE XX: 23 MARCH-19 APRIL 1959, by D. W. Pritchard. Rept. on Contract Nonr-248(20). July 62, 67p. Data rept. 40; Reference 62-8.

DESCRIPTORS: *Oceanographical data, *Estuaries, Meteorological data, Physical properties, Geography, Temperature, Density, Chemical properties, Sea water, Salinity, Tables, *Chesapeake Bay.

See also AD-290 376

AD-290 378 OTS $7.60

Chesapeake Bay Inst., Johns Hopkins U. [Annapolis, Md.]
BAY CRUISE XXI: 6 JULY-17 JULY 1959, by D. W. Pritchard. Rept. on Contract Nonr-248(20). July 62, 72p. 1 ref. Data rept. 41; Reference 62-9.

DESCRIPTORS: *Oceanographical data, *Estuaries, Meteorological data, Physical properties, Geography, Temperature, Density, Chemical properties, Sea water, Salinity, Tables, *Chesapeake Bay.

See also AD-290 377

AD-290 379 OTS $5.60

Chesapeake Bay Inst., Johns Hopkins U. [Annapolis, Md.]
BAY CRUISE XXII: 3 NOVEMBER-16 DECEMBER 1959, by D. W. Pritchard. Rept. on Contract Nonr-248(20). July 62, 56p. 1 ref. Data rept. 42; Reference 62-10.

DESCRIPTORS: *Oceanographical data, *Estuaries, Meteorological data, Physical properties, Geography, Temperature, Density, Chemical properties, Sea water, Salinity, Tables, *Chesapeake Bay.

(See also AD-290 378)

AD-290 380 OTS $5.60

Chesapeake Bay Inst., Johns Hopkins U. [Annapolis, Md.]
BAY CRUISE XXIII: 27 APRIL-17 MAY 1960, by D. W. Pritchard. Rept. on Contract Nonr-248(20). July 62, 57p. 1 ref. Data rept. 43; Reference 62-11.

DESCRIPTORS: *Oceanographical data, *Estuaries, Meteorological data, Physical properties, Geography, Temperature, Density, Chemical properties, Sea water, Salinity, Tables, *Chesapeake Bay.

(See also AD-290 379)

AD-290 381 OTS $6.60

Chesapeake Bay Inst., Johns Hopkins U. [Annapolis, Md.]
BAY CRUISE XXIV: 22 AUGUST-9 SEPTEMTER 1960, by D. W. Pritchard. Rept. on Contract Nonr-248(20). July 62, 65p. 1 ref. Data rept. 44; Reference 62-12.

DESCRIPTORS: *Oceanographical data, Meteorological data, Physical properties, Geography, Temperature, Density, Chemical properties, Sea water, Salinity, Tables, *Chesapeake Bay.

(See also AD-290 380)

AD-290 382 OTS $5.60

Chesapeake Bay Inst., Johns Hopkins U. [Annapolis, Md.]
BAY CRUISE XXV: 22 NOVEMBER-5 DECEMBER 1960, by D. W. Pritchard. Rept. on Contract Nonr-248(20). July 62, 51p. 1 ref. Data rept. 45; Reference 62-13.

DESCRIPTORS: *Oceanographical data, Meteorological data, Physical properties, Geography, Temperature, Density, Chemical properties, Sea water, Salinity, Tables, *Chesapeake Bay.

(See also AD-290 381)

AD-290 383 OTS $3.60

Chesapeake Bay Inst., Johns Hopkins U. [Annapolis, Md.]
BAY CRUISE XXVI: 27 FEBRUARY-7 APRIL 1961, by D. W. Pritchard. Rept. on Contract Nonr-248(20). July 62, 33p. 1 ref. Data rept. 46; Reference 62-14.

DESCRIPTORS: *Oceanographical data, Meteorological data, Physical properties, Geography, Temperature, Density, Chemical properties, Sea water, Salinity, Tables, *Chesapeake Bay.

See also AD-290 382

AD-290 384 OTS $4.60

Chesapeake Bay Inst., Johns Hopkins U. [Annapolis, Md.]
BAY CRUISE XXVII: 19 JULY-1 AUGUST 1961, by D. W. Pritchard. Rept. on Contract Nonr-248(20). July 62, 43p. 1 ref. Data rept. 47; Reference 62-15.

DESCRIPTORS: *Oceanographical data, Meteorological data, Physical properties, Geography, Temperature, Density, Chemical properties, Sea water, Salinity, Tables, *Chesapeake Bay.

See also AD-290 383

AD-281 184 OTS $1.10

Marine Lab., U. of Miami, Coral Gables, Fla.
BEHAVIOUR OF PLANKTON IN RELATION TO HYDROGRAPHIC FACTORS, by Hilary B. Moore. Final rept. on Contract Nonr-840(12). June 62, 7p. 6 refs. Rept. no. ML 62186; Rept. no. 8935.

DESCRIPTORS: *Marine biology, *Plankton, Oceanography, *Hydrographic surveying, Aquatic animals, Temperature, Pressure, Light, Adaptation (Physiology).

Predicted distributions were compared with observed plankton distributions under a range of hydrographic conditions. Predictions using typical values show the relative sensitivity of the copepods to temperature, illumination, and pressure.

AD-280 297 OTS $3.60

Texas A & M Coll., College Station.
OPPORTUNITIES FOR ENVIRONMENTAL RESEARCH OFF PANAMA CITY, FLORIDA, by R. D. Gaul, A. D. Kirwan, Jr., and N. E. J. Boston. Rept. on Contract Nonr-2119(4). 1 Apr 62, 32p. 36 refs. Reference no. 62-5T.

DESCRIPTORS: *Oceanographic equipment, Laboratories, Oceanographic data, *Data processing systems, Tides, Ocean waves, Ocean currents, Sedimentation, *Florida, Gulf of Mexico.

An environmental studies project was developed utilizing two Navy platforms and automated techniques for data collection and analysis. This report describes the present status of the project and indicates some other areas of environmental research that might be exploited with facilities and techniques at hand.

Physics of the Atmosphere

NASA N63-12702 OTS $0.50

Goddard Space Flight Center, National Aeronautics and Space Administration, Greenbelt, Md.
A MODEL OF THE QUIET IONOSPHERE, by J. Carl Seddon. Feb 63, 14p. 13 refs. Technical note D-1670.

NYO-10464 OTS $5.60

Isotopes, Inc., Westwood, N. J.
HIGH ALTITUDE BALLOON SAMPLING PROGRAM, by Colin G. Sanderson, Raymond J. Lagomarsino and others. Quarterly rept. no. 1, on Contract AT(30-1)3071 1 Dec 62, 52p. 12 refs.

ENGINEERING

PB 162 857 OTS $1.60

Naval Engineering Experiment Station, Annapolis, Md.
PROPULSION SHAFTING INSULATING SLEEVES, by W. G. Schreitz. 16 Feb 55, 14p. 7 refs. Evaluation rept. 040042.

DESCRIPTORS: *Propellers (Marine), *Insulating materials, Laminated plastics, Load distribution, Tests, *Shafts, Troque, Propeller hubs, Ship hulls, Corrosion inhibition

Loading tests are described for a plastic sleeve intended to insulate a bronze propeller from its shaft in order to prevent galvanic action with the ship's steel hull. Alternating torsion tests were made on a 5.5" diameter propeller shaft and a simulated propeller. The propeller was insulated from the shaft by means of a polyester-gl glass laminate sleeve 1/16" thick which fits over the shaft and key. During the early stages of the torsion test the propeller hub slipped on the shaft and sheared off the plastic keyway on the sleeve. However, insulation was maintained. (Author)

PB 181 122 Rev. 2 OTS $1.00

Bureau of Yards and Docks, Washington, D. C.
HEATING, COOLING VENTILATING FORMULAS. Engineered Performance Standards, Public Works Maintenance. Sep 62, 32p. NAVDOCKS P-704.1.

DESCRIPTORS: *Mechanical engineering, *Handbooks, *Heating systems, *Refrigeration systems, *Ventilation, Maintenance.

Contents:
Section 1. Cooling and Ventilating
Pump down, charge or recharge air conditioning or refrigeration systems and components
Clean evaporative or air cooled condensers; metal or wood cooling towers
Section 2. Heating
Drain and fill with water: fire tube boiler
Open or close: fire side and water side of any boiler
Clean water side: fire tube boiler
Clean fire side: fire tube boiler
Assist boiler inspector
Fire tube boiler tubes, remove and reinstall

Aeronautical Engineering

NASA N63-12389 OTS $1.25

Ames Research Center, National Aeronautics and Space Administration, Moffett Field, Calif.
A LARGE-SCALE WIND-TUNNEL INVESTIGATION OF A WINGLESS VERTICAL TAKE-OFF AND LANDING AIRCRAFT, by David G. Koenig and James A. Brady. Feb 63, 49p. 4 refs. Technical note D-1335.

AD-280 049 OTS $1.10

Behavioral Sciences Lab., [Aerospace Medical] Div., Wright-Patterson AFB, Ohio.
NYLON NET SEAT FOR A MODIFIED RB-57 AIRCRAFT, by H. T. E. Hertzberg. Rept. on Biophysics of Flight. Dec 61, 9p. 2 refs. ASD Technical rept. rept. 61-206.

DESCRIPTORS: *Seats, *Nylon, *Aircraft equipment, Design, Tests, Photography.

A light-weight, adjustable easily demountable net seat for persons who must operate in cramped quarters is described. Tests lasting for more than a year in a modified RB-57 have shown the seat to be fully satisfactory. Design drawings and photographs of the method of installation are included. (Author)

NASA N62-71850 OTS $1.00

Langley Research Center, National Aeronautics and Space Administration, Langley [Station] Va.
DESIGN GUIDE FOR PITCH-UP EVALUATION AND INVESTIGATION AT HIGH SUBSONIC SPEEDS OF POSSIBLE LIMITATIONS DUE TO WING-ASPECT-RATIO VARIATIONS, by Kenneth P. Spreemann. Aug 59, declassified 11 July 61, 37p. 23 refs. Technical memo. X-26.

Chemical Engineering

ARF-3187-10 OTS $1.10

Armour Research Foundation, Chicago, Ill.
ELECTROSTATIC CLASSIFICATION OF SUBMICRON AIRBORNE PARTICLES, by G. Langer. Progress rept. 1 Oct-1 Dec 62, on Contract AT(11-1)578. Dec 62, 6p.

HW-SA-2810 OTS $1.60

Hanford Atomic Products Operation, Richland, Wash.
MATERIALS OF CONSTRUCTION IN NUCLEAR FUELS SEPARATIONS FACILITIES, by William L. Walker. Rept. on Contract AT(45-1)1350. 5 Dec 62, 17p.

PB 162 816 OTS $4.60

Electron Tube Research Lab., U. of Minnesota, Minneapolis.
DIFFUSION AND INTERFACE STUDIES ON CATHODE SLEEVE NICKEL, by W. G. Shepherd. Quarterly rept. no. 2, 9 Apr-9 July 53, on Contract NObsr-63172. [1953] 43p. 12 refs.

DESCRIPTORS: *Cathodes, *Nickel alloys, *Manganese alloys, Grain structure (Metallurgy), Spectrographic analysis, Furnaces, Welding, *Coatings, *Barium compounds, *Strontium compounds, Oxides, Chemical reactions, Thermodynamics.

A description is given of preliminary experiments on vacuum preparation of small samples of nickel alloys. The influence of grain size on diffusion is discussed. Some experiments directed at controlling the grain size of available nickel are described. A description is given of a furnace and the technique used for the welding of diffusion couples. A spectro-photometric method for the analysis of Ni-Mn alloys is described. A standardization curve has been obtained and consideration given to limits of sensitivity. A description is given of a preliminary experiment on the reaction rate of carbon with a BaSrO coating. Experimental techniques are described. The thermodynamics of a number of possible cathode reactions has been considered and related to similar work of others. (Author) (See also PB 162 815)

PB 162 817 OTS $3.60

Electron Tube Research Lab., U. of Minnesota, Minneapolis.
DIFFUSION AND INTERFACE STUDIES ON CATHODE SLEEVE NICKEL, by W. G. Shepherd. Quarterly rept. no. 3, 9 July-9 Oct 53, on Contract NObsr-63172. [1953] 27p. 12 refs.

DESCRIPTORS: *Cathodes, *Nickel alloys, *Manganese alloys, Nickel, Diffusion, Annealing, *Coatings, *Strontium, Adhesion, *Tracer studies.

An outline is given of the procedures which have been used in the preparation of diffusion couples of Mn-Ni alloy and pure Ni. The results of exploratory measurements of the evolution of Sr from a series of base nickels are presented. A description is given for a tube structure which will permit periodic monitoring of the cathode evolution products during life, the drawing of a uniform cathode current during life and periodic checks of the peak emission. Some of the details of the cathode evolution products by means of radio-active tracers are given. (See also PB 162 816)

PB 162 818 OTS $4.60

Electron Tube Research Lab., U. of Minnesota, Minneapolis.
DIFFUSION AND INTERFACE STUDIES ON CATHODE SLEEVE NICKEL, by W. G. Shepherd. Quarterly rept. no. 4, 9 Oct 53-9 Jan 54, on Contract NObsr-63172. [1954] 43p. 12 refs.

DESCRIPTORS: *Cathodes, *Nickel alloys, *Titanium alloys, *Aluminum alloys, *Magnesium alloys, *Manganese alloys, Melting, Diffusion, Spectrographic analysis, *Coatings, *Strontium, Oxides, Impurities

The procedures involved in the preparation of alloy systems of Ni-Al, Ni-Ti and Ni-Mg are discussed. Diffusion studies on the Mn-Ni system have been completed and can be described by the equation $D_{Mn} = 6.3e^{-\frac{66,700}{RT}}$ cm^2/sec. A summary is given on the evolution of materials from an oxide coated cathode during life which leads to the conclusion that observations of the Sr evolved should provide a measure for the rate of reduction of the oxide coating by impurities in the cathode base nickel. (See also PB 162 817)

IS-432 OTS $1.10

Institute for Atomic Research, Iowa State U. of Science and Tech., Ames.
SIMPLE HIGH-VOLTAGE TRAPEZOIDAL PULSE GENERATOR, by Luigi Gonella. [7 Mar 62]. 7p.

NASA N63-12704 OTS $1.75

Lewis Research Center, National Aeronautics and Space Administration, Cleveland, Ohio.
MICROPOWER TRANSISTOR LOGIC CIRCUITS, by John C. Sturman. Feb 63, 71p.. 20 refs. Technical note D-1462.

AD-267 535 OTS $5.60

Litton Electron Tube Corp., San Carlos, Calif.
HIGH PERVEANCE GUN STUDY, by J. R. Hechtel and R. D. Harris. Quarterly rept. no. 1, 1 June-1 Sep 61, on Contract DA 36-039-sc-87313. 29 Sep 61, 53p. 7 refs.

DESCRIPTORS: *Electron guns, Magnetrons, Electrostatics, *Electron beams, Space charges, Electron transitions, Focusing, Magnetic fields, Design, Tests, Electron tubes, Cathodes (Electron tubes), Electrons, Electric fields, Mathematical analysis, Test sets.

A study was initiated on the formation of stable and well-focused, high perveance, large diameter, hollow beams. Both magnetron injection gun types, and Pierce type gun derivatives are under investigation. A theoretical treatment of the magnetron injection gun based on an analytic space charge solution is given. The problems of transition of the beam from the space charge flow condition in the gun to the conditions for a stable beam in a drift tube are discussed. Results on cathode loading in a magnetron injection gun are reported. A preliminary design for an electrostatic hollow beam gun with magnetic focusing is presented. The problem of maintaining the percentage of rotational beam energy at a low level is discussed. Severa methods for reducing the percentage of rotational beam energy are suggested. A report on the progress of the construction of various beam testers is also given. (Author)

AD-272 759 OTS $7.60

Litton Electron Tube Corp., San Carlos, Calif.
HIGH PERVEANCE GUN STUDY, by J. R. Hechtel and R. D. Harris. Quarterly rept. no. 2, 1 Sep-1 Dec 61, on Contract DA 36-039-sc-87313. 16 Feb 62, 78p. 8 refs.

DESCRIPTORS: *Electron guns, *Magnetrons, Electrostatics, *Electron beams, Cathode (Electron tubes), Space charges, Magnetic, Fields, Electric fields, Focusing, Design, Digital computers, Test equipment, Electron transitions, Mathematical analysis, Test sets, *Electron accelerators.

The design parameters for a 2" diameter magnetron-injection gun are given. These parameters are derived from an analytic space-charge solution derived in the first report. Special attention is given to the design of the accelerator and to the ratio of cathode length to cathode diameter. Effects of the cathode current on the electron flow pattern are discussed. The electrical design of an electrostatically-powered, hollow-beam gun is presented. Characteristics of the gun; i. e. perveance, cathode loading, electron trajectory plots etc., are discussed, and maximum values are given for several beam diameters. Construction details of a movable carbon target beam tester are outlined. (Author) (See also AD-267 535)

AD-274 668 OTS $5.60

Litton Electron Tube Corp., San Carlos, Calif.
HIGH PERVEANCE GUN STUDY, by R. D. Harris, J. R. Hechtel, and Gerold E. Pokorny. Quarterly rept. no. 3, 1 Dec 61-1 Mar 62, on Contract DA 36-039-sc-87313. 30 Mar 62, 54p. 1 ref.

DESCRIPTORS: *Electron guns, *Magnetrons, Electrostatics, Focusing, Cathodes (Electron tubes), Space charges, Magnetic fields, Electric fields, Design, *Electron beams, Electron transitions, Simulation, Analog computer, Digital computers, Test sets, Test equipment, Mathematical analysis.

This report includes:
ELECTRON RAY TRACING AT RELATIVISTIC VELOCITIES, by J. R. Hechtel and D. F. Brauch. 1962, 11p. illus.

A study of the formation of stable and well-focused, high-perveance, large-diameter, hollow beams is presented. Both magnetron injection-type guns and Pierce-type gun derivatives are being investigated. Results of computer electron trajectory calculations for a 2 in. diameter magnetron-injection gun are given. These results are compared to the analytic space-charge flow solution from which the gun was designed and also compared to the preliminary test results of the 2 in. diameter gun. A discussion of tests to determine the amount of rotation in beams formed in magnetron-injection guns is presented. Results are given for one particular gun. Construction details of the electrostatic, hollow-beam gun are outlined (Author) (See also AD-272 759)

MATT-110 OTS $3.60

Plasma Physics Lab., Princeton U., N. J.
VOLTAGE DOUBLER RECTIFIER, by John G. Murray and Richard D. Farley. Rept. on Contract AT(30-1)1238. 15 Jan 62, 31p.

TID-14926 OTS $1.60

Sandia Corp., Albuquerque, N. Mex.
ON THE IMPEDANCE OF A BASE-DRIVEN VERTICAL ANTENNA OF FINITE DIMENSIONS WITH A RADIAL CONDUCTOR GROUND SYSTEM, by Charles W. Harrison, Jr. Rept. on Contract AT(29-1)789. 28 Nov 61, 12p. 13 refs. SCDC-2521.

AD-285 304 OTS $9.60

Stanford Electronics Labs., Stanford U., Calif.
AN ANALYSIS OF RANDOM-PARAMETER-PERTURBING ADAPTIVE SYSTEMS, by J. D. Burroughs. Rept. on Contract Nonr-225(38). June 62, 117p. 33 refs. Technical rept. no. 2106-3; SEL-62-053.

DESCRIPTORS: *Control systems, *Feedback, Analysis, Synthesis, Automatic, Perturbation theory, Statistical functions, Analog computers, Noise, *Adaptive control systems.

The general subject of adaptive systems is discussed and two basic approaches are considered: the analysis-synthesis approach and the performance-feedback approach. The relative merits of each approach are examined and the performance-feedback approach is investigated in detail.

Ordnance, Missiles, and Satellite Vehicles

NASA N63-12593 OTS $0.50

Ames Research Center, National Aeronautics and Space Administration, Moffett Field, Calif.
A FLIGHT EVALUATION OF LUNAR LANDING TRAJECTORIES USING A JET VTOL TEST VEHICLE, by L. Stewart Rolls and Fred J. Drinkwater III. Feb 63, 15p. 1 ref. Technical note D-1649.

NASA N63-12686 OTS $3.00

Ames Research Center, National Aeronautics and Space Administration, Moffett Field, Calif.
Z-FUNCTION SOLUTIONS FOR THE MOTION AND HEATING DURING ATMOSPHERE ENTRY FROM EQUATORIAL ORBITS OF A ROTATING PLANET, by Frederick W. Boltz. Feb 63, 195p. 15 refs. Technical note D-1555.

NASA N63-12948 OTS $1.25

Goddard Space Flight Center, National Aeronautics and Space Administration, Greenbelt, Md.
POWER INPUT TO A SMALL FLAT PLATE FROM A DIFFUSELY RADIATING SPHERE WITH APPLICATION TO EARTH SATELLITES: THE SPINNING PLATE, by Fred G. Cunningham. Feb 63, 46p. 1 ref. Technical note D-1545.

NASA N63-12928 OTS $1.00

Goddard Space Flight Center, National Aeronautics and Space Administration, Greenbelt, Md.
A SATELLITE ORBIT COMPUTATION PROGRAM FOR IZSAK'S SECOND-ORDER SOLUTION OF VINTI'S DYNAMICAL PROBLEM, by Raymond V. Borchers. Feb 63, 37p. 8 refs. Technical note D-1539.

NASA N63-12916 OTS $0.75

Langley Research Center, National Aeronautics and Space Administration, Langley Station, Va.
STATIC LONGITUDINAL AND LATERAL STABILITY CHARACTERISTICS AT A MACH NUMBER OF 3.00 OF SQUARE AND CIRCULAR PLAN-FORM REENTRY VEHICLES, WITH SOME EFFECTS OF CONTROLS AND LEADING-EDGE EXTENSIONS, by Byron M. Jaquet. May 60, declassified 5 June 62. 23p. 4 refs. Technical memo. X-272.

NASA N63-12592 OTS $0.75

Langley Research Center, National Aeronautics and Space Administration, Langley Station, Va.
A STUDY OF THE EFFECT OF A DEADBAND ABOUT A DESIRED PERIGEE ON THE GUIDANCE OF A SPACE VEHICLE APPROACHING THE EARTH, by Jack A. White. Feb 63, 23p. 7 refs. Technical note D-1607.

NASA N62-72003 OTS $0.50

Langley Research Center, National Aeronautics and Space Administration, Langley [Station] Va.
WIND-TUNNEL INVESTIGATION AT HIGH SUBSONIC SPEED OF THE STATIC LONGITUDINAL STABILITY CHARACTERISTICS OF A WINGED REENTRY VEHICLE HAVING A LARGE NEGATIVELY DEFLECTED FLAP-TYPE CONTROL SURFACE, by Paul G. Fournier. Dec 59, declassified 8 Dec 61. 20p. 10 refs. Technical memo. X-179.

LADC-5489 OTS $1.10

Los Alamos Scientific Lab., N. Mex.
SATELLITE-BASED DETECTION OF NUCLEAR DETONATIONS IN SPACE, by Richard F. Taschek. Rept. on Contract W7405-eng-36. 10 Oct 62, 9p.

NASA N63-12640 OTS $0.75

National Aeronautics and Space Administration, Washington, D. C.
LUNAR LANDING PROPULSION CONSIDERATIONS, by K. R. Stehling. Feb 63, 23p. 3 refs. Technical note D-1723.

PB 162 862 OTS $1.10

Naval Ordnance Test Station, China Lake, Calif.
LINEARIZED THEORY OF THE PENETRATION OF A ROD INTO A THICK TARGET, by William A. Allen and James W. Rogers. Apr 62, 8p. 4 refs. NAVWEPS rept. 7906; NOTS TP 2913; NASA N62-12586.

DESCRIPTORS: *Metal plates, Penetration, Aluminum alloys, *Rods, Plasticity, Jets, *Terminal ballistics, Elasticity, Theory, Shaped charges, Hydrodynamics, Projectiles, Velocity.

A linearized theory is proposed for the penetration of a rod into a thick target. The proposed theory, for the case of six rod materials and an aluminum target, represents the experimental data better than the conventional hydrodynamic theory based upon a constant dynamic yield strength of the target.

Sanitation and Safety Engineering

AD-294 595 repriced OTS $0.50

Arctic Aeromedical Lab., Fort Wainwright, Alaska
WATER CONSERVATION THROUGH REUSE OF FLUSHING FLUID IN AN AEROBIC SEWAGE TREATMENT PROCESS, by C. F. Walters and J. A. Anderegg. Aug 62, 18p. 4 refs. Technical documentary rept. AAL TDR-62-9.

DESCRIPTORS: *Disposal, Water, *Sewage, Latrines, *Wastes (Sanitary engineering), *Decontamination, *Artic regions, *Alaska.

The Arctic Health Research Center was requested to design, fabricate and operate under field conditions an aerobic waste treatment system wherein the effluent is reused as the water carrier, to be used at various remote Air Force Stations in Alaska. The plant was to serve approximately 10 men. In August 1958, a recirculating waste treatment unit was installed near Anchorage consisting of comminution, aeration, settling and recirculation of settled fluid for flushing purposes. For 16 months, weekly samples were obtained from the latter unit and analyzed for: total solids, total volatile solids, organic and ammonia nitrogen, pH, and chlorides. In addition, the daily usage of the system was recorded along with the volume of overflow. The results of chemical analyses indicate a gradual buildup of solids, ammonia, and organic nitrogen and chlorides. With a theoretical detention time (in the aeration chamber) of 53 days, the pH remained extremely low and total solids content increased to above 20,000 mg/1. (Author)

RFP-253 OTS $1.60

Dow Chemical Co., Denver, Colo.
RADIOACTIVE FILTER BANK FIRE DETECTION SYSTEMS, by R. W. Walker. Rept. on Contract AT(29-1)1106. 27 Dec 61, 14p. 2 refs.

HW-SA-2481 OTS $1.60

Hanford Atomic Products Operation, Richland, Wash.
A TELEMETERING INSTALLATION TO REPORT COLUMBIA RIVER DATA BY RADIO, by H. A. Kramer and J. L. Rand. Rept. on Contract AT(45-1)1350. 1 Mar 62, 14p.

HW-SA-2301 OTS $2.60

Hanford Atomic Products Operation, Richland, Wash.
USE OF LAKE ROOSEVELT STORAGE TO LOWER RIVER TEMPERATURES, by H. A. Kramer and J. P. Corley. Rept. on Contract AT(45-1)1350. 26 Oct 61, 22p.

OTO-58-3 OTS $4.60

Holmes and Narver, Inc., Los Angeles, Calif.
RADIOLOGICAL SAFETY SUPPORT, comp. by Carl Minkkinen, Henry P. Schlacks and others. Operation Hardtack, Phase 1. Apr 59, 42p.

DPSPU-62-30-5 OTS $1.60

Savannah River Lab., Aiken, S. C.
CONTROL OF TRITIUM HEALTH HAZARDS AT THE SAVANNAH RIVER PLANT, by W. C. Reinig and E. L. Albenesius. Rept. on Contract AT(07-2)1. Jan 62, 16p. 13 refs.

MACHINERY, FABRICATION, AND ACCESSORY EQUIPMENT

Engines and Propulsion Systems

AD-279 533 OTS $1.10

AeroChem Research Labs., Inc., Princeton, N. J.
ADVANCED PROPULSION SYSTEMS. Final rept. on Contract Nonr-2773(00), continuation of Contract Nonr-2336(00). Mar 62, 6p. 6 refs. Rept. no. TP-44; NASA N62-10867.

DESCRIPTORS: Propulsion, *Jet engines, *Rocket motors, Guns, *Nuclear propulsion, *Ion engines, Glow discharges, *Plasma engines.

The six reports issued during the course of the program are summarized.

TID-16730 OTS $1.10

Knolls Atomic Power Lab., Schenectady, N. Y.
COMPUTER PROGRAMS FOR OPTIMUM START-UP OF NUCLEAR PROPULSION SYSTEMS, by C. N. Shen (Rensselaer Polytechnic Inst.) and F. G. Haag. Rept. on Contract W31-109-eng-52. [16 July 62] 4p. 2 refs.

UCRL-6091-T OTS $1.10

Lawrence Radiation Lab., U. of California, Livermore.
PROPELLANTS FOR ELECTRICAL PROPULSION SYSTEMS. PANEL DISCUSSION OF ROCKET PROPELLANTS, AMERICAN CHEMICAL SOCIETY MEETING, BERKELEY, AUGUST 8, by Robert H. Fox. Rept. on Contract W7405-eng-48. 1960. 4p.

NASA N63-12972 OTS $0.50

Lewis Research Center, National Aeronautics and Space Administration, Cleveland, Ohio.
CASCADE INVESTIGATION OF COOLING CHARACTERISTICS OF A CORRUGATED-INSERT AIR-COOLED TURBINE BLADE FOR USE IN A TURBOPROP ENGINE, by Hadley T. Richards. Mar 60, declassified 5 June 62. 15p. 3 refs. Technical memo. X-85.

NASA N63-12532 OTS $0.50

Lewis [Research Center, National Aeronautics and Space Administration] Cleveland, Ohio.
EXPERIMENTAL INVESTIGATION OF A HIGH SUBSONIC MACH NUMBER TURBINE HAVING HIGH ROTOR BLADE SUCTION-SURFACE DIFFUSION, by William J. Nusbaum and Cavour H. Hauser. 20 Nov 56, declassified 27 Sep 62. 19p. 4 refs. Research memo. RM E56I18.

NASA N63-12909 OTS $1.25

Lewis [Research Center, National Aeronautics and Space Administration] Cleveland, Ohio.
EXPLORATORY INVESTIGATION OF PERFORMANCE OF EXPERIMENTAL FUEL-RICH HYDROGEN COMBUSTION SYSTEM, by Arthur L. Smith and Jack S. Grobman. 25 June 58, declassified 5 June 62. 43p. 6 refs. Research memo. RM E58C19a.

NASA N63-12195 OTS $0.75

Lewis Research Center, National Aeronautics and Space Administration, Cleveland, Ohio.
FEASIBILITY OF APPLYING FIELD-ION EMISSION TO ELECTROSTATIC ROCKET ENGINES, by N. Stankiewicz. Jan 63, 21p. 8 refs. Technical note D-1563.

NASA N63-12908 OTS $0.50

Lewis [Research Center, National Aeronautics and Space Administration] Cleveland, Ohio.
INVESTIGATION OF AN AFTERBURNING RAMJET USING GASEOUS HYDROGEN AS FUEL AT MACH NUMBER OF 3.0, by Joseph F. Wasserbauer. 17 June 57, declassified 5 June 62. 12p. 3 refs. Research memo. RM E57C29.

PB 162 866 OTS $2.60

Naval Engineering Experiment Station, Annapolis, Md.
1015 HOUR ENDURANCE TEST OF PHILIPS MODEL 1/4D EXTERNAL COMBUSTION ENGINE, by Alan R. Schrader. [1 Feb 51] 22p. 7 refs. E.E.S. rept. C-3599-A(3).

DESCRIPTORS: *External combustion engines, Generators, Maintenance, Reliability, Tests.

A Philips Model 1/4D external combustion engine, equipped as a portable generator set, was operated as continuously as practicable at its rated output, 124.5 watts, or more, in order to indicate its reliability and probable maintenance requirements. The performance of the unit was generally satisfactory except for relatively numerous minor difficulties such as air leaks, failures of the compressor suction valve assembly and irregular fuel flow. At the time the test was discontinued, after 1015 hours operation, the engine still operated satisfactorily and there was no difficulty in maintaining rated power output. A post-trial dissembly inspection of the engine showed it to be in a generally satisfactory condition. It was recommended that the engine be considered suitable for service applications wherein its special features are of importance, provided certain improvements were made. (Author)

Manufacturing Equipment and Processes

AD-289 150 OTS $8.10

Columbia U. School of Engineering, New York.
MINIMAX SURVEILLANCE SCHEDULES, by Robert Roeloffs. Technical rept. no. 16 on Contract Nonr-266(55). 15 Feb 62, 85p. 5 refs.

DESCRIPTORS: *Reliability, Failure (Mechanics), *Logistics, Statistical analysis, Quality control, *Scheduling.

An analysis is made of the problem of finding the optimal schedule for checking an operating system subject to failure which can only be detected by an inspection of the system. If a cost is attached to each inspection of the system and also to undetected failure, then there exists the problem of scheduling inspections to minimize total costs. This situation also applied to the surveillance inspection of stored goods subject to deterioration with time.

HW-74597 OTS $1.10

Hanford Atomic Products Operation, Richland, Wash.
THE FEASIBILITY OF ULTRASONIC INSPECTION OF THICK WALL STEEL PIPE FOR WELD DEFECTS, by G. L. Waldkoetter and C. L. Frederick. Rept. on Contract AT(45-1)1350. 29 June 62, 7p.

MATERIALS

PB 162 863 OTS $1.10

Nepa Div., Fairchild Engine and Airplane Corp., Oak Ridge, Tenn.
AN INVESTIGATION OF THE USE OF PHOSPHATES FOR COATING BERYLLIUM CARBIDE UNDERBODIES CONTAINING ADMIXED GRAPHITE, by Thomas H. Elmer. Apr 51, 10p. 5 refs. NEPA 1805.

DESCRIPTORS: *Phosphate coatings, Feasibility studies, *Beryllium compounds, *Carbides, Graphite, Coatings, Ceramic coatings, Reactor fuel elements.

The feasibility of using phosphate glazes as coatings for underbodies composed of beryllium carbide and graphite was investigated. It was found that the phosphates are readily reduced at temperatures below 1400°C (2550°F) by carbon and beryllium carbide. The glassy phase was destroyed in the course of reduction, leaving a loose oxide layer on the surface of the underbody. Phosphorus was lost from the phosphate compounds during the reduction. Phosphates were found to be reduced more rapidly by hydrogen than by beryllium carbide. Lanthanum phosphate and cerium phosphate were found to be stable at temperatures up to 1700°C (3090°F), whereas all other phosphates investigated were found to decompose partially or completely at much lower temperatures. (Author)

AD-296 149 repriced OTS $1.25

Quartermaster Research and Engineering Command, Natick, Mass.
QUARPEL APPLICATION AND TEST METHODS FOR COTTON THREAD, by Pauline P. Hall, Edward B. Frederick, and Howard D. Corkum. Jan 63, 46p. 7 refs. Textile Series rept. no. 124.

DESCRIPTORS: *Cotton textiles, *Threads, Finishes, *Moistureproofing, Impregnation, Standards, Test methods.

The application of "Quarpel" to cotton sewing thread and the resultant water repellency properties are described. A typical method of application is given. Test methods for determining repellency initially and after laundering have been developed and a new method of handling skeins in these tests has been devised. Data are presented which show the superiority of "Quarpel"-treated thread over a commercial "durable" water-repellent compound in accelerated laundering tests. (Author)

Ceramics and Refractories

DRI-2056 OTS $2.60

Denver Research Inst., Colo.
INTERMEDIATE-TEMPERATURE OXIDATION OF BERYLLIDES, by Frank C. Perkins. Quarterly progress rept. 1 June-1 Sep 62, on Contract AT(11-1)1092. 15 Sep 62, 28p. 2 refs.

UCRL-6839-T (Summary) $1.60

Lawrence Radiation Lab., U. of California, Livermore.
GROWTH OF BERYLLIUM OXIDE SINGLE CRYSTALS by Herbert W. Newkirk and Donald D. Kingman. Rept. on Contract W7405-eng-48. [1962] 13p.

SCTM-139-62(11) OTS $1.60

Sandia Corp., Albuquerque, N. Mex.
SOME EFFECTS OF MINOR COBALT ADDITIONS TO THE COMPOSITION (80 Ba-8Ca-12Pb)TiO_3, by R. L. Cook. Rept. on Contract AT(29-1)789. June 62, 12p. 6 refs.

Fuels, Lubricants, and Hydraulic Fluids

NASA N63-12509 OTS $0.50

Lewis[Research Center, National Aeronautics and Space Administration] Cleveland, Ohio.
EFFECT OF COMBUSTION GAS PROPERTIES ON TURBOJET-ENGINE PERFORMANCE WITH HYDROGEN AS FUEL, by Robert E. English. 10 Apr 56, declassified 5 June 62. Research memo. RM-E55J17a.

NASA N63-12541 OTS $1.50

Lewis [Research Center, National Aeronautics and Space Administration] Cleveland, Ohio.
LIQUID HYDROGEN AS A JET FUEL FOR HIGH-ALTITUDE AIRCRAFT, by Abe Silverstein and Eldon W. Hall. 15 Apr 55, declassified 5 June 62. 57p. 6 refs. Research memo. RM-E55C28a.

NASA N63-12907 OTS $1.25

Lewis [Research Center, National Aeronautics and Space Administration,] Cleveland, Ohio.
TURBOJET PERFORMANCE AND OPERATION AT HIGH ALTITUDES WITH HYDROGEN AND JP-4 FUELS, by W. A. Flemin, H. R. Kaufman and others. 7 Aug 56, declassified 5 June 62. 47p. 9 refs. Research memo. RM-E56E14.

Rubber and Elastomers

AD-280 279 OTS $1.10

Frick Chemical Lab., Princeton U., N. J.
RUBBER ELASTICITY IN A HIGHLY CROSSLINKED EPOXY SYSTEM, by D. Katz and A. V. Tobolsky. Rept. on Contract Nonr-1858(07). 5 Apr 62, 10p. 8 refs. Technical rept. RLT-42.

DESCRIPTORS: *Epoxy resins, *Rubber, *Elasticity, Theory, Molecular structure, Amines.

This work is a study in the field of viscoelastic and elastic behavior of highly crosslinked systems. It was observed that epoxide crosslinked with amines have have well defined transition and rubbery plateau regions. The concepts of the theory of rubber elasticity were applied to Epon 826 (Shell Chemical Company) crosslinked by four aliphatic amines (EDA, DETA, TETA, TEPA). From the measured values of the Gehman 10 sec modulus in the rubbery region the "front factor" in the equation for rubbery networks was calculated. By use of equations that take into consideration the molecular structure of the resin derived for rubbery networks by one of the authors in an earlier work, the front factors were calculated and the agreement between the values obtained from experiments and the ones calculated is very good. (Author)

AD-281 565 OTS $1.60

Frick Chemical Lab., Princeton U., N. J.
THE VISCOELASTIC PROPERTIES OF CROSSLINKED POLY(ETHYLENE TETRASULFIDE) POLYMERS, by A. A. Tobolsky, R.B. Beevers, and G. D. T. Owen. Rept. on Contract Nonr-1858(07). 19 Apr 62, 16p. 13 refs. Technical rept. RLT-43.

DESCRIPTORS: *Elastomers, *Polyethylene plastics, *Sulfides, *Viscoelasticity, Molecular structure, Propanes, Chlorides.

A range of crosslink densities has been introduced into poly(ethylene tetrasulfide) by use of the trifunctional agent, 1, 2, 3, -Trichloropropane. The formation of a crosslinked structure has been established by torsional modulus measurements over a range of temperatures from the glass transition region to a region of rapid stress decay due to interchange reactions between polysulfide linkages. Estimates have been made of the deviation from ideal rubber elasticity by calculating the front factors. Some similarity with crosslinked poly(ethyl acrylate) was obtained. The density of crosslinked poly(ethylene tetrasulfide) was found to increase with the amount of crosslinking up to 35% crosslinking agent, and then to fall steeply at higher crosslink densities. Samples containing less than 5% crosslinking agent showed evidence of crystallization. (Author)

MATHEMATICS

IS-507 OTS $0.50

Ames Lab., Iowa State U. of Science and Tech.
A FORTRAN PROGRAM FOR DETERMINING THE THERMAL DIFFUSIVITY OF FINITE LENGTH SAMPLES, by Paul D. Maycock. Rept. on Contract W7405-eng-82. Sep 62, 16p. 2 refs. NASA N63-11813.

AD-281 699 OTS $5.60

Columbia U. [New York].
LOCALIZATION OF SOME PROPERTIES OF CONTINUOUS MAPS. APPLICATIONS TO FIBRE HOMOTOPY EQUIVALENCE AND TO BUNDLE CLASSIFICATION, by Albrecht Dold. Rept. on Contract Nonr-266(57). [1961] 53p. 13 refs. Rept. no. CU-10-ONR-266(57)-M.

DESCRIPTORS: *Algebraic topology, Topology

AD-281 637 OTS $10.10

Columbia U. [New York].
TOPICS IN RIEMANNIAN GEOMETRY, VOLUME 2, by James Eells, Jr. Rept. on Contract Nonr-266(57). [1961] 128p. 32 refs. Rept. no. CU-9-ONR-266(57)-M.

DESCRIPTORS: *Differential geometry, Algebraic topology.

Contents:
The reducibility theorem of G. de Rham
Totally geodesic submanifolds
The group of isometries of a Riemannian manifold
Killing vector fields

(See also AD-277 255)

Computing Devices

TID-17350 OTS $4.60

Digital Computer Lab., U. of Illinois, Urbana.
DESIGN OF CIRUCITS FOR THE PATTERN ARTICULATION UNIT, by K. C. Smith. [Rept. on Contract AT(11-1)235]. 31 Aug 62, 46p. Rept. no. 127.

HW-SA-2502 OTS $1.60

Hanford Atomic Products Operation, Richland, Wash.
OPTIMIZING PROGRAMMING EFFORT THROUGH MACHINE PROCESSING AND SCHEDULING, by Ray E. Cain. Rept. on Contract AT(45-1)1350. 3 May 62, 12p.

AD-280 314 OTS $1.60

Michigan U. Coll. of Literature, Science, and the Arts, Ann Arbor.
THE STAR-HEIGHT OF REGULAR EXPRESSIONS, by L. C. Eggan. Technical note on Contract Nonr-1224(21), and Contract DA-SIG-36-039-61-G4. Mar 62, 12p. 5 refs. Rept. nos. 04422, 03105-23-T.

DESCRIPTORS: *Computer logic, *Algebras, Special functions, Mathematical logic, Number theory

MECHANICS

LADC-5480 OTS $1.60

Los Alamos Scientific Lab., N. Mex.
PARTICLE-IN-CELL FLUID DYNAMICS ON THE IBM STRETCH MACHINE, by Thomas Daniel Butler. Rept. on Contract W7405-eng-36. [1962] 21p. 8 refs.

TID-15500 OTS $1.60

Oak Ridge Gaseous Diffusion Plant, Tenn.
THE LAMINAR-TURBULENT TRANSITION FOR FLOW IN PIPES, CONCENTRIC ANNULI, AND PARALLEL PLATES, by Richard W. Hanks. Rept. on Contract W7405-eng-26. 24 Apr 62, 20p. 15 refs.

NYO-10147 OTS $7.60

Pennsylvania State U., University Park.
STRESSES AT NOZZLE CONNECTIONS OF PRESSURE VESSELS. PART I. DESCRIPTION OF NOZZLES AND TEST RESULTS, by D. E. Hardenbergh and S. Y. Zamrik. Rept. for 1 Feb 56-31 Dec 61, on Contract AT(30-1)1874. 1 Mar 62, 80p. 2 refs.

Aerodynamics and Pneumatics

NASA N62-71916 OTS $2.50

Ames Research Center, National Aeronautics and Space Administration, Moffett Field, Calif.
EFFECTS OF WING-CRANK, LEADING-EDGE CHORD EXTENSIONS AND HORIZONTAL-TAIL HEIGHT ON THE LONGITUDINAL STABILITY OF SWEPT-WING MODELS AT MACH NUMBERS FROM 0.6 TO 1.4, by Roy M. Wakefield. Oct 59, declassified 1 Sep 61. 116p. 11 refs. Technical memo. X-92.

NASA N63-12701 OTS $1.00

Ames Research Center, National Aeronautics and Space Administration, Moffett Field, Calif.
STATIC AERODYNAMIC CHARACTERISTICS OF A SHORT BLUNT 10^{o} SEMIVERTEX ANGLE CONE AT A MACH NUMBER OF 15 IN HELIUM, by Melvin J. Fohrman. Feb 63, 37p. 12 refs. Technical note D-1648.

NASA N62-70365 OTS $1.25

Ames Research Center, National Aeronautics and Space Administration, Moffett Field, Calif.
TRANSONIC AERODYNAMIC CHARACTERISTICS OF A LATERAL CONTROL EMPLOYING ROTATABLE AIRFOILS MOUNTED VERTICALLY AT THE WING TIPS OF A 45^{o} SWEPTBACK WING, FUSELAGE, AND TAIL COMBINATION, by John A. Axelson. June 59, declassified 19 Aug 60. 49p. 7 refs. NASA MEMO-6-9-59A.

NASA N63-13107 OTS $1.25

Ames [Research Center, National Aeronautics and Space Administration], Moffett Field, Calif.
WIND-TUNNEL TESTS OF THE STATIC LONGITUDINAL CHARACTERISTICS AT LOW SPEED OF A SWEPT-WING AIRPLANE WITH BLOWING FLAPS AND LEADING-EDGE SLATS, by Harry A. James and Ralph L. Maki. 5 July 57, declassified 23 Apr 62. 45p. 11 refs. Research memo. RM A57D11.

AD-275 554 OTS $2.60

Arnold Engineering Development Center, Arnold Air Force Station, Tenn.
A PRESSURE DATA SYSTEM FOR A 50-IN. CONTINUOUS MACH 8 WIND TUNNEL, by F. C. Hightower, Jr. Rept. on Contract AF 40(600)800. May 62, 29p. AEDC TDR-62-96; NASA N62-12391.

DESCRIPTORS: Hypersonics, *Hypersonic windtunnels, Wind tunnels, Pressure, Measurement, *Control systems, Instrumentation, Design, Calibration, Aerodynamic data.

This report is a description of a pressure data system designed and built for use with a 50-inch, continuous, Mach 8 wind tunnel. The system is basically a nine-channel system, with a capacity for 99 model pressure ports. Three ranges and seven reference pressure levels are employed to provide an extended pressure level coverage, while maintaining low-level sensitivity. Control circuits are employed to automatically select the proper range and reference level for each pressure measurement, and to simplify calibration procedures. A description of the measuring and control systems components is included, along with a section on the operation of the control system. The report is concluded with an evaluation of the pressure data system, based on a two-year period of operation. (Author)

TID-16884 OTS $1.60

Bendix Corp., Southfield, Mich.
PNEUMATIC SERVO ACTUATOR, by C. B. Sung. Rept. on Contract [AT(29-2)705] 10 Oct 62, 11p.

NASA N62-71860 OTS $0.75

[Flight Research Center] National Aeronautics and Space Administration, Edwards, Calif.
FLIGHT INVESTIGATION OF THE EFFECT OF DISTRIBUTED ROUGHNESS ON SKIN DRAG OF A FULL-SCALE AIRPLANE, by Edwin J. Saltzman. Sep 59, declassified 18 Dec 61.

NASA N62-71939 OTS $1.00

Langley Research Center, National Aeronautics and Space Administration, Langley [Station] Va.
AERODYNAMIC CHARACTERISTICS AT MACH NUMBER 2.01 OF AN AIRPLANE CONFIGURATION HAVING A CAMBERED AND TWISTED ARROW WING DESIGNED FOR A MACH NUMBER OF 3.0, by Odell A. Morris and A. Warner Robins. Sep 59, declassified 1 Sep 61. 33p. 3 refs. Technical memo. X-115.

NASA N62-71848 OTS $2.50

Langley Research Center, National Aeronautics and Space Administration, Langley [Station] Va.
AERODYNAMIC CHARACTERISTICS OF A 0.0667-SCALE MODEL OF THE NORTH AMERICAN X-15 RESEARCH AIRPLANE AT TRANSONIC SPEEDS, by Robert S. Osborne. Sep 59, declassified 1 Sep 61. 108p. 3 refs. Technical memo X-24.

NASA N62-71962 OTS $1.75

Langley Research Center, National Aeronautics and Space Administration, Langley [Station] Va.
EFFECTS OF TWIST AND CAMBER AND THICKNESS ON THE AERODYNAMIC CHARACTERISTICS OF A 75° SWEPT ARROW WING AT A MACH NUMBER OF 2.91, by James N. Mueller and John E. Grimaud. Dec 59, declassified 8 Dec 61. 67p. 27 refs. Technical memo. X-138.

NASA N62-72017 OTS $0.75

Langley Research Center, National Aeronautics and Space Administration, Langley [Station] Va.
INVESTIGATION OF THE LOW SUBSONIC FLIGHT CHARACTERISTICS OF A MODEL OF A FLAT-TOP HYPERSONIC-BOOST GLIDE CONFIGURATION HAVING AN ARROWHEAD WING, by Peter C. Boisseau. Dec 59, declassified 19 Aug 60. 21p. 6 refs. Technical memo. X-193.

NASA N63-12533 OTS $2.25

Langley [Research Center] National [Aeronautics and Space Administration, Langley Station] Va.
INVESTIGATION OF STATIC PRESSURES AND BOUNDARY-LAYER CHARACTERISTICS ON THE FORWARD PARTS OF NINE FUSELAGES OF VARIOUS CROSS-SECTIONAL SHAPES AT $M_\infty = 2.01$, by Lowell E. Hasel and Walter L. Kouyoumjian. 21 Jan 57, declassified 27 Sep 62. 93p. 4 refs. Research memo. L56I13.

NASA N62-71896 OTS $2.00

Langley Research Center, National Aeronautics and Space Administration, Langley [Station] Va.
LOW-SPEED STATIC LONGITUDINAL AND LATERAL STABILITY CHARACTERISTICS OF A VARIABLE-INCIDENCE DELTA-WING CANARD MODEL WITH HIGH-LIFT CANARD SURFACES, BY Clarence D. Cone, Jr. Sep 59, declassified 11 July 61, 71p. 4 refs. Technical memo. X-72.

NASA N63-12480 OTS $1.50

Langley Research Center, National Aeronautics and Space Administration, Langley Station, Va.
SOME EFFECTS OF SWEEP AND ASPECT RATIO ON THE TRANSONIC FLUTTER CHARACTERISTICS OF A SERIES OF THIN CANTILEVER WINGS HAVING A TAPER RATIO OF 0.6, by John R. Unangst and George W. Jones, Jr. Feb 63, 58p. 3 refs. Technical note D-1594; supersedes NACA RM-L55I13a, NACA RM-L53G10a, and NASA N62-63513.

NASA N62-71885 OTS $1.00

Langley Research Center, National Aeronautics and Space Administration, Langley [Station] Va.
WIND-TUNNEL INVESTIGATION OF PRESSURES AND HINGE MOMENTS ON A SWEPTBACK T-MOUNTED HORIZONTAL TAIL AT MACH NUMBERS FROM 0.60 TO 1.075, by Robert J. Ward and Joseph M. Hallissy, Jr. Nov 59, declassified 16 Oct 61. 34p. 3 refs. Technical memo. X-61.

NASA N62-14926 OTS $13.50

Langley Research Center, National Aeronautics and Space Administration, Langley Station, Va.
WIND-TUNNEL INVESTIGATION OF THE AERODYNAMIC AND STRUCTURAL-DEFLECTION CHARACTERISTICS OF AN INFLATABLE AIRPLANE, by H. Clyde McLemore. Aug 62, 203p. 1 ref. NASA TM X-680.

NASA N62-71829 OTS $2.50

Langley Research Center, National Aeronautics and Space Administration, Langley [Station] Va.
WIND-TUNNEL INVESTIGATION OF THE STATIC STABILITY OF A 1/56-SCALE MODEL OF THE X-1E AIRPLANE AT MACH NUMBERS OF 2.37, 2.98, AND 4.01, by Fred M. Smith. Aug 59, declassified 11 July 61. 120p. 9 refs. Technical memo. X-5.

NASA N63-12911 OTS $2.50

Langley [Research Center, National Aeronautics and Space Administration] Langley [Station] Va.
A WIND-TUNNEL INVESTIGATION OF THE WING LOADS DUE TO DEFLECTED INBOARD AILERONS ON A 45° SWEPTBACK WING AT TRANSONIC SPEEDS, by Atwood R. Heath, Jr. and Ann W. Igoe. 21 July 58, declassified 5 June 62. 102p. 11 refs. Research memo. RM L58E12.

NASA N63-12554 OTS $0.75

Lewis Research Center, National Aeronautics and Space Administration, Cleveland, Ohio.
OVEREXPANDED PERFORMANCE OF CONICAL NOZZLES WITH AREA RATIOS OF 6 AND 9 WITH AND WITHOUT SUPERSONIC EXTERNAL FLOW, by Norman T. Musial and James J. Ward. Sep 59, declassified 27 Sep 62. 25p. 5 refs. Technical memo. X-83.

NASA N63-12506 OTS $1.00

Lewis [Research Center, National Aeronautics and Space Administration] Cleveland, Ohio.
THRUST AND PUMPING CHARACTERISTICS OF A SERIES OF EJECTOR-TYPE EXHAUST NOZZLES AT SUBSONIC AND SUPERSONIC FLIGHT SPEEDS, by Donald P. Hearth and Alfred S. Valerino. 17 Nov 54, declassified 22 Aug 62. 35p. Research memo. RM E54H19.

Hydrodynamics, Hydraulics, and Hydrostatics

AD-281 479 OTS $4.60

Brown U. Div. of Applied Mathematics, Providence, R. I.
CLIMB OF A BORE ON A BEACH, by D. V. Ho and R. E. Meyer. Technical rept. no. 47 on Contract Nonr-562(07). Mar 62, 42p. 8 refs.

DESCRIPTORS: *Beaches, *Water waves, Theory, Fluid mechanics, Hydrodynamics, Equations of motion.

The motion of a bore on a beach of constant slope is studied on the basis of the non-linear shallow water theory. The asymptotic behaviour of the bore near the shore line is established for a general class of boundary conditions, and an explicit approximate solution is given. The results explain why the motion of the bore, as it climbs up the beach, becomes increasingly insensitive to the water waves catching up with it, and therefore also to the initial motion of the water behind the bore. (Author)

AD-279 629 OTS $2.60

California U., Los Angeles.
SOME OBSERVATIONS OF PLANE LAMINAR JET FLOWS IMPINGING ON FIXED OBJECTS, by Alan Powell and R. C. Chanaud. Rept. on Contract Nonr-233(62). Feb 62, 27p. 6 refs. Dept. of Engineering rept. no. 62-8; NASA N62-10957.

DESCRIPTORS: Fluid flow, *Liquid jets, Hydrodynamic configurations, Cylindrical bodies, Hysteresis, Density.

Experimental two-dimensional flow patterns resulting from a plane laminar jet striking a cylinder are described and illustrated by photographs with special reference to circular cylinders whose diameter is of the order of the jet width. For the conditions of these experiments the jet is always divided, but the two parts of the jet either become confluent behind the cylinder, or remain bifurcated and flow in almost straight paths so as to include a broad angle. For asymmetric positioning of the cylinder, the deflection of the larger part of the bifurcated jet decreases steadily as the asymmetry is increased, but it is never directed to the same side as the cylinder. (Author)

PB 162 856 OTS $2.60

David Taylor Model Basin, Washington, D. C.
WATER TUNNEL INVESTIGATIONS OF STEADY STATE CAVITIES, by Phillip Eisenberg and Hartley L. Pond. Oct 48, 21p. 6 refs. Rept. no. 668.

DESCRIPTORS: *Cavitation, Bubbles, Fluid flow, Drag, Fluid dynamic properties, *Water tunnels

The investigations described are an outgrowth of experiments conducted in connection with the so-called cativation method or analogue for developing forms having specified critical cavitation numbers. This method is based on the definition of critical cavitation number as that corresponding to the minimum pressure coefficient of the body. It is an experimental device by means of which the offsets of a solid body are obtained from "steady-state" cavitation bubbles formed behind elementary nose or leading-edge shapes placed in a stream. (Author)

AD-281 319 OTS $1.60

Iowa Inst. of Hydraulic Research, Iowa City.
THE VISCOUS DRAG OF SUBMERGED AND FLOATING BODIES, by L. Landweber and Jin Wu. Interim rept. on Contract Nonr-1611(04). Mar 62, 17p. 3 refs. NASA N62-15496.

DESCRIPTORS: *Hydrodynamics, *Drag, Viscosity, *Wake, Ships, *Bodies of revolution, *Underwater objects, *Floating bodies, Fluid dynamic properties.

"Exact" formulas for the viscous drag of submerged bodies of revolution and ship forms are derived and applied to evaluate the errors in the Betz-Tulin formula and two new alternative approximations. It is indicated that all three give adequate accuracy at distances of at least 2-1/2 wake thicknesses behind a body, and that the Betz-Tulin formula is intermediate in accuracy among the three viscous-drag formulas. (Author)

Statics, Kinematics, and Kinetics

AD-280 200 OTS $2.60

Brown U., Providence, R. I.
STRESS-STRAIN-TIME RELATIONS AND IRREVERSIBLE THERMODYNAMICS, by D. C. Drucker. Technical rept. no. 29 on Contract Nonr-562(20). Mar 62, 29p. 9 refs. NASA N62-11687.

DESCRIPTORS: *Structures, *Stresses, *Thermodynamics, Linear systems, Nonlinear systems, Elasticity, Plasticity, Viscosity, *Stability, Deformation.

Some progress is reported in the continuing search for the essential features of the macroscopic behavior of linear and non-linear material. A comparison is made of the validity, the value, and the interrelation of three approaches to the study of elastic, plastic, and viscous response under isothermal conditions. One approach is through the stability postulate of positive work by the forces of an external agency on the changes it causes; another is the extension of Onsager's reciprocal relations for linear irreversible thermodynamics; and the third is the concept or postulate of path independence. In particular it is shown that the surface of constant rate of entropy production in force or velocity space does not play a significant role in general for non-linear dissipative systems. When instead a limited or full path independence is employed to give a normality condition in force or velocity space, the stability postulate gives convexity. A tentative conclusion is reached that in all probability the desirable synthesis of non-linear macroscopic behavior from the microscopic will involve explicitly or implicitly just as strong a set of postulates as a more direct phenomenological approach. (Author)

AD-290 499 OTS $8.10

Brown U. Div. of Applied Mathematics, Providence, R. I.
THEORY OF ELASTIC STABILITY AND POST-BUCKLING BEHAVIOUR, by W. T. Koiter. Technical rept. no. 80 on Contract Nonr-562(10). Oct 62, 88p. 6 refs. Rept. no. C11-80; NASA N63-10755.

DESCRIPTORS: *Tensor analysis, Elasticity, *Buckling, *Elastic shells, Deformation, Vector analysis, *Continuous media, *Stability.

This report includes: Notes on tensor analysis in three-dimensional Euclidean space.

METALLURGY

BM-RI-6079 OTS $1.60

Albany Metallurgy Research Center, Ore.
TITANIUM-IRIDIUM PHASE DIAGRAM, by J. G. Croeni, C. E. Armantrout, and H. Kato. Rept. on Contract AT(11-1)599. 1962. 19p. 8 refs. NASA N62-16537.

NASA N63-12214 OTS $1.00

Ames Research Center, National Aeronautics and Space Administration, Moffett Field, Calif.
EFFECTS OF SPUTTERING WITH HYDROGEN IONS ON TOTAL HEMISPHERICAL EMITTANCE OF SEVERAL METALLIC SURFACES, by Donald L. Anderson and George J. Nothwang. Jan 63, 36p. 17 refs. Technical note D-1646.

ARF-2198-34 OTS $1.10

Armour Research Foundation, Chicago, Ill.
IMPROVED ZIRCONIUM ALLOYS, by D. Weinstein and F. C. Holtz. Quarterly rept. for 1 July-30 Sep 62, on Contract AT(11-1)578. 12 Oct 62, 7p.

DRI-2057 OTS $1.10

Denver Research Inst., Colo.
DETERMINATION OF THE NIOBIUM-RICH REGION OF THE TERNARY PHASE DIAGRAMS, NIOBIUM-TUNGSTEN-HAFNIUM AND NIOBIUM-TUNGSTEN-ZIRCONIUM, by Albert S. Yamamoto and Charles E. Lundin. Quarterly progress rept. no. 1, 1 June-31 Aug 62, on Contract AT(11-1)1092. 1 Sep 62, 7p.

DC-61-7-6 OTS $2.60

General Electric Co., Cincinnati, Ohio.
OXIDATION PROTECTIVE COATINGS FOR A TUNGSTEN ALLOY 86.5W-6Ni-3Fe-4Mo-0.5B, by W. R. Butts. 7 July 61, 29p. 8 refs. DM-60-310.

AD-279 866 OTS $1.10

Illinois Inst. of Tech., Chicago.
DISCUSSION TO PAPER BY CLAREBROUGH, HARVREAVES, AND LORETTO IN "RECOVERY AND RECRYSTALLIZATION OF METALS" AIME BOOK TO BE PUBLISHED IN 1962, by Paul Gordon. Technical rept. no. 11 on Contract Nonr-1406(03). Mar 62, 5p.

DESCRIPTORS: Metals, *Copper, *Nickel, *Annealing, Crystallization, *Crystal lattice defects.

IS-439 OTS $1.60

Institute for Atomic Research, Iowa State U. of Science and Tech., Ames.
THE APPLICATION OF WAX LAPS TO VIBRATORY POLISHERS, by E. N. Hopkins and D. T. Peterson. Rept. on Contract W7405-eng-82. 19 Apr 62, 14p.

IS-442 OTS $1.60

Institute for Atomic Research, Iowa State U. of Science and Tech., Ames.
THORIUM-MOLYBDENUM PHASE DIAGRAM, by O. D. McMasters, P. E. Palmer, and W. L. Larsen. Rept. on Contract W7405-eng-82. 19 Apr 62, 16p. 6 refs.

TID-17364 OTS $1.60

Institute of Metals and Explosives Research, U. of Utah, Salt Lake City.
A KINETIC STUDY OF SILICA ADSORPTION ON THORIA SURFACES, by Jong S. Cho and Milton E. Wadsworth. Technical rept. no. 17, on Contract W7405-eng-26. 15 May 62, 20p. 5 refs.

LADC-5424 OTS $1.10

Los Alamos Scientific Lab., N. Mex.
THE PROCESSING OF PLUTONIUM BY ION EXCHANGE. II. THE ANION-EXCHANGE SEPARATION OF PLUTONIUM AND THORIUM, by D. B. James and E. L. Christensen. Rept. on Contract W7405-eng-36. 1962. 6p. 5 refs.

TID-13887 OTS $4.60

Metals Research Lab., Carnegie Inst. of Tech., Pittsburgh, Pa.
EFFECT OF ORIENTATION ON THE SURFACE SELF-DIFFUSION OF COPPER, by Jei Y. Choi and Paul G. Shewmon. Rept. on Contract AT(30-1)2314. 9 Oct 61, 43p. 20 refs.

TID-7625 OTS $1.50

Nuclear Metals, Inc., Concord, Mass.
TECHNICAL PAPERS OF THE THIRTEENTH METALLOGRAPHIC GROUP MEETING. Held January 14-15, 1959, at Armour Research Foundation Chicago, Ill. comp. by H. P. Roth. Rept. on Contract AT(07-2)1 Nov 62, 62p. NMI-4970.

UCRL-13052 OTS $2.75

Southern Research Inst., Birmingham, Ala.
THE FRICTIONAL CHARACTERISTICS OF VARIOUS ALLOYS AND COATINGS AT ELEVATED TEMPERATURES, by Herman L. Lessley and Clifford L. Dotson. Rept. on Contract W7405-eng-48. 21 Sep 62, 185p. NASA N63-12278.

PB 181 458 OTS $0.75

Williams, Clyde and Co., Columbus, Ohio.
ELECTRON-BEAM WELDING - ITS INDUSTRIAL POTENTIAL, by R. E. Greenlee. Rept. on Contract CC 4757. [1962] 22p. 34 refs.

DESCRIPTORS: *Welding, *Electron beams, *Electron guns, Bibliography.

An evaluation of commercial applications.

Ferrous Metals

TID-17220(Pt.1) OTS $3.60

European Atomic Energy Community.
THE CORROSION OF STEELS BY HIGH-TEMPERATURE WATER AND STEAM. PART I. BEHAVIOR WITH NO IRRADIATION, by Ph. Berge. May 61, 37p.

TID-17220(Pt.2) OTS $3.60

European Atomic Energy Community.
THE CORROSION OF STEELS BY WATER AND STEAM AT HIGH TEMPERATURE. PART II. BEHAVIOUR UNDER IRRADIATION, by Ph. Berge. Feb62, 33p. 35 refs.

Structural Metallurgy and Corrosion

PB 162 858 OTS $1.60

Naval Engineering Experiment Station, Annapolis, Md.
CORROSION TESTS OF TYPES 201 AND 202 Cr-Ni-Mn STAINLESS STEELS IN SEA WATER AND MARINE ATMOSPHERE, by R. B. Niederberger. 21 Nov 58, 12p. 2 refs. Research and Development rept. 910105A.

DESCRIPTORS: *Stainless steel, *Corrosion, *Sea water, Corrosion research, Deterioration, Atmosphere, Fracture (Mechanics), Marine meteorology, *Chromium alloys, *Nickel alloys, *Manganese alloys.

The corrosion behavior of AISI Types 201 and 202 Cr-Ni-Mn austenitic stainless steels was determined in sea water and marine atmosphere. In general, these steels behaved similarly to the 300 series steels. However, in addition to the usual severe pitting and "wormholing," panels immersed in sea water also developed stress-corrosion cracks along sheared edges and at drilled holes. Supplementary tests of U-bend specimens in brackish Severn River water showed that a sensitization treatment at 1200°F lowered the resistance of the 201 and 202 steels to stress-corrosion cracking. (Author)

AD-281 230 OTS $1.60

Northwestern Technological Inst., Evanston, Ill.
AN INTERPRETATION OF THE ANOMALOUS INTERNAL FRICTION IN COLD WORKED Al-Cu ALLOYS OBSERVED BY KE, by R. D. Carnahan and J. O. Brittain. Technical rept. no. 4 on Contract Nonr-1228(17). 23 Mar 62, 11p. 6 refs. NASA N62-12016.

DESCRIPTORS: *Aluminum alloys, *Copper alloys, *Cold-working, *Crystal lattice defects, Friction, Shear stresses, *Internal friction.

NUCLEAR PHYSICS AND NUCLEAR CHEMISTRY

BNL-6501 OTS $0.86

Brookhaven National Lab., Upton, N. Y.
SOME SPECIFIC CONSIDERATIONS OF THE POTENTIAL HAZARDS OF HEAVY PRIMARY COSMIC RAYS, by Howard J. Curtis. 17 Dec 62, 22p. 8 refs.

TID-17183 OTS $2.60

Colorado U., Boulder.
THE DECAY OF Sc^{44} AND Sc^{44m}, by L. T. Dillman, J. J. Kraushaar, and J. D. McCullen (Princeton U.). Rept. on Contract AT(11-1)535. 1962. 24p. 12 refs. UCOL-P-513.

PB 162 860 OTS $4.60

General Dynamics/Fort Worth, Tex.
AIR AND CONCRETE SCATTERING OF NEUTRONS. MONTE CARLO CALCULATIONS, by M. B. Wells. Rept. on Contract AF 33(600)32054. 2 Apr 58, 42p. 8 refs. Document no. NARF-58-15T; MR-N-197.

DESCRIPTORS: Air, Concrete, *Neutron scattering, *Neutron flux, Differential cross section, *Monte Carlo method

This report presents results from Monte Carlo calculations of the angular distribution of neutrons scattered from air and concrete. The Monte Carlo method was used to evaluate the integrals that represent the contribution to the total scattered flux from the first five orders of scattering. The scattered neutron flux at various separation distances was computed for a 3.25 Mev point monodirectional source located at a height of 12.5 feet above the surface of a concrete slab. Differential scattering cross sections based on a complex square well model and differential scattering cross sections assuming isotropic scattering in the center of mass system were used in the Monte Carlo calculations. The method used in computing the variance of the scattered flux is outlined. The standard deviation computed was found to be generally not more than 10% of the scattered flux. (Author)

PB 162 861 OTS $4.60

General Dynamics/Fort Worth, Tex.
A MONTE CARLO PROCEDURE FOR CALCULATING PENETRATION OF NEUTRONS THROUGH STRAIGHT CYCLINDRICAL DUCTS, by D. G. Collins. Rept. on Contract AF 33(657)7201. 24 Nov 61, 49p. 10 refs. Document no. NARF-61-33T; MR-N-286.

DESCRIPTORS: Cylindrical bodies, Ducts, Neutrons, *Neutron flux, Penetration, Energy, Distribution, Intensity, *Neutron scattering, *Monte Carlo method

The Monte Carlo method is applied to evaluate the energy and angular distributions and the intensity of the scattered neutron flux that penetrates a straight cylindrical duct. A discussion of the scattering theory involved is given, as well as the sampling techniques peculiar to the duct-penetration problem. The method is evaluated on the basis of comparisons with experimental data. (Author)

TID-17273 OTS $3.60

Institute of Polymer Research, Polytechnic Inst. of Brooklyn, N. Y.
SOLID STATE POLYMERIZATION INITIATED BY GAMMA RADIATION, by Herbert Morawetz, Benjamin Post and others. Progress rept. on Contract AT(30-1)1715. 25 Oct 62, 33p. 3 refs.

TID-17272 OTS $10.50

Michigan U., Ann Arbor.
ACTIVATION ANALYSIS. NUCLEAR CHEMICAL RESEARCH. RADIOCHEMICAL SEPARATIONS, ed. by R. S. Maddock and W. Wayne Meinke. Progress rept. No. 11, Nov 61-Oct 62, on Contract AT(11-1)1143. Nov 62, 139p. 71 refs.

TID-15720 OTS $1.60

Tracerlab, Inc., Richmond, Calif.
SCINTILLATING ION EXCHANGE RESIN, by A. H. Heimbuch. Progress rept. no. 1, on Contract AT(30-1)2885. 28 May 62, 12p. 5 refs.

Elementary Particles

BNL-6214 OTS $2.60

Brookhaven National Lab., Upton, N. Y.
THE K^--p INTERACTION AT 2.24 Bev/c. I. EFFECTIVE MASS DISTRIBUTIONS, by L. Bertanza, V. Brisson and others. Rept. on Contract [AT(30-2)GEN-16] 27 July 62, 23p. Prepared in cooperation with Syracuse U.

TID-16786 OTS $1.10

Northwestern U., Evanston, Ill.
THE LIFETIME OF THE Λ^0 HYPERON, by J. Auman, M. M. Block and others. Rept. on Contract [AT(11-1)89] 7p.

Instruments and Installations

APDA-149 OTS $4.60

Atomic Power Development Associates, Inc., Detroit, Mich.
EVALUATION OF THE BLAKE SODIUM RESISTIVITY METER. Rept. on Contract AT(11-1)865. 15 Oct 62, 41p. 7 refs.

BNL-5866 OTS $1.60

Brookhaven National Lab., Upton, N. Y.
BUBBLE DENSITY IN A HYDROGEN BUBBLE CHAMBER, by B. Sechi Zorn and G. T. Zorn. 21 Dec 61, 15p. 14 refs.

HW-SA-2191 OTS $1.60

Hanford Atomic Products Operation, Richland, Wash.
SCINTILLATING GLASSES FOR ALPHA COUNTING, by U. L. Upson. Rept. on Contract AT(45-1)1350. 1962. 19p. 9 refs.

AD-281 470 OTS $1.10

Michigan U. [Ann Arbor].
FURTHER WORK ON AN IMAGE INTENSIFIER-SCINTILLATOR DEVICE FOR DETERMINATION OF PROFILES AND IMAGES OF WEAK BEAMS OF HIGH ENERGY PARTICLES, by Dale Dickinson (Lawrence Radiation Lab.) and Martin Perl. Technical rept. no. 5 on Contract Nonr-1224(23). Mar 62, 7p.

DESCRIPTORS: *Particle beams, Intensity, *Image intensifiers (Electronics), *Scintillation counters, Monitors, Charged particles.

AD-281 469 OTS $1.60

Michigan U. [Ann Arbor].
THE STATUS OF THE SCINTILLATION CHAMBER, by Martin L. Perl. Technical rept. no. 6 on Contract Nonr-1224(23). Mar 62, 12p. 15 refs.

DESCRIPTORS: *Scintillation counters, Radiation measurement systems, Ionization chambers, Particle beams, Detection.

A summary is given of the usefulness of the scintillation chamber in relation to the spark chamber, those experimental areas where the luminscent chamber remains useful, and a few developments in the technique.

Nuclear Engineering

ACNP-62550 OTS $4.60

Allis-Chalmers Mfg. Co., Washington, D. C.
EXTRUDED CERAMIC NUCLEAR FUEL DEVELOPMENT PROGRAM. Final rept., Phase II on Contract AT(11-1)767. 15 June 62, 44p.

ANL-FGF-324 OTS $1.60

Argonne National Lab., Ill.
SINTERING OF URANIUM MONOCARBIDE PRECIPITATED FROM LIQUID METAL MEDIA, by T. R. Johnson, G. D. White and others. Rept. on Contract W31-109-eng-38. 11 June 62, 14p. UAC-6537.

ANL-FGF-247 OTS $1.60

Argonne National Lab., Ill.
US AND ThS BODIES, by P. D. Shalek. Rept. on Contract W31-109-eng-38. 6 Apr 61, 14p. 2 refs. UAC-5151.

ARF-K-6018-3 OTS $4.60

Armour Research Foundation, Chicago, Ill.
STUDIES OF REACTOR CONTAINMENT, by P. Lieberman. Bi-monthly progress rept. Sep-Oct 62, on Contract AT(11-1)578. 1962. 41p.

BNL-5891 OTS $1.10

Brookhaven National Lab., Upton, N. Y.
THE EFFECT OF GRAPHITE CHEMICAL REACTIVITY ON THERMAL INSTABILITY CONDITIONS IN AIR-COOLED CHANNELS, by Donald G. Schweitzer. 2 Mar 62, 8p. 4 refs.

TID-16813 OTS $1.60

Engineering Research Labs., Columbia U., New York
BASIC EXPERIMENTAL STUDIES OF BOILING FLUID FLOW AND HEAT TRANSFER AT ELEVATED PRESSURES, by Bruce Matzner. Monthly progress rept., Aug 62, on Contract AT(30-3)187. 31 Aug 62, 15p. (MPR-XIII-8-62).

HW-SA-2445 OTS $1.10

Hanford Atomic Products Operation, Richland, Wash.
DISTORSION OF HELICAL WIRE WRAPPING, by K. R. Merckx. Rept. on Contract AT(45-1)1350. 22 Jan 62, 5p.

HW-SA-2309 OTS $1.10

Hanford Atomic Products Operation, Richland, Wash.
EXTENSIVE MOVEMENT OF FISSION FRAGMENTS AND PLUTONIUM DEMONSTRATED IN UO_2 IRRADIATION TESTS, by J. L. Bates, J. A. Christensen, and W. E. Roake. Rept. on Contract AT(45-1)1350. 6 Oct 61, 9p. 7 refs.

HW-SA-2807 OTS $1.60

Hanford Atomic Products Operation, Richland, Wash.
FISSION PRODUCT CASKS AND CONTAINERS PROTOTYPE DESIGN, SCALING OF MODELS FOR IMPACT TESTING, by D. W. McLenegan. Rept. on Contract AT(45-1)1350. 19 Nov 62, 15n. 4 refs.

HW-SA-2843 OTS $2.60

Hanford Atomic Products Operation, Richland, Wash.
FISSION-PRODUCT CONFINEMENT PROGRAM AT HANFORD AND SUPPORTING RESEARCH STUDIES, by R. K. Hilliard, C. E. Linderoth, and E. R. Irish. Rept. on Contract AT(45-1)1350. 3 Dec 62, 29p. 9 refs.

HW-SA-2675 OTS $1.60

Hanford Atomic Products Operation, Richland, Wash.
IRRADIATION OF UO_2-PuO_2 CAPSULES, by W. J. Bailey and T. D. Chikalla. Rept. on Contract AT(45-1)1350. 8 Nov 62. 20p.

HW-SA-2668 OTS $2.60

Hanford Atomic Products Operation, Richland, Wash.
IRRADIATION TESTING OF PROTOTYPIC UO_2-PuO_2 PRTR FUEL ELEMENTS, by M. D. Freshley. Rept. on Contract AT(45-1)1350. 8 Nov 62, 22p.

HW-71521(Rev.) OTS $0.50

Hanford Atomic Products Operation, Richland, Wash.
MEASUREMENT OF CYLINDRICAL SHAPES, by K. R. Merckx and R. G. Wheeler. Rept. on Contract AT(45-1)1350. 27 Aug 62, 22p.

UCRL-7127 OTS $1.60

Lawrence Radiation Lab., U. of California, Livermore.
DISCUSSION OF ASME PAPER 62-WA-218: STUDY OF REACTOR KINETICS, BY A. STANLEY THOMPSON, by A. B. Miller. Rept. on Contract W7405-eng-48. 1 Nov 62, 11p.

TID-14495 OTS $1.60

Los Alamos Scientific Lab., N. Mex.
FISSION PRODUCT BEHAVIOR IN DIRECT CONTACT CORE LIQUID METAL FUELED REACTORS, by Richard M. Bidwell. Rept. on Contract W7405-eng-36. 1962. 20p. 28 refs. LADC-4955.

MITNE-21 OTS $2.75

Massachusetts Inst. of Tech., Cambridge.
THE IRRADIATION OF SANTOWAX OMP IN THE M.I.T. IN-PILE LOOP. PART I. SUMMARY TO OCTOBER 5, 1961, by D. T. Morgan and E. A. Mason. Rept. on Contract AT(10-1)1067. May 62, 167p. 22 refs. IDO-11104.

MITNE-22(Bks.I&II) OTS $7.50 Set

Massachusetts Inst. of Tech., Cambridge.
THE IRRADIATION OF SANTOWAX OMP IN THE M.I.T. IN-PILE LOOP. PART II. EQUIPMENT DESIGN, PROCEDURES AND RESULTS OF IRRADIATION TO OCTOBER 5, 1961, by D. T. Morgan and E. A. Mason. Rept. on Contract AT(10-1)1067. May 62, 643p. 100 refs. IDO-11105; NASA N63-12130.

NUMEC-P-51 OTS $1.10

Nuclear Materials and Equipment Corp., Apollo, Pa.
DEVELOPMENT OF PLUTONIUM-BEARING FUEL MATERIALS, by Karl H. Puechl. Monthly progress letter for Oct 62, on Contract AT(30-1)2389. 5 Nov 62, 6p.

TID-7640 OTS $2.00

Oak Ridge National Lab., Tenn.
ISOTOPE TECHNOLOGY DEVELOPMENT PROGRAM. FOURTH ANNUAL CONTRACTORS MEETING CONDUCTED AT OAK RIDGE NATIONAL LABORATORY, DECEMBER 3-4, 1962, Rept. on Contract W7405-eng-26. [1962] 88p. 2 refs.

FXM-406 OTS $2.60

Pratt and Whitney Aircraft Div., United Aircraft Corp., Hartford, Conn.
REACTOR DEADTIMES, by J. R. Lamarsh and E. M. West. [Rept. on Contract AT(11-1)229]. 30 Apr 53, declassified 11 Dec 59. 28p.

SC-4459(RR) OTS $4.60

Sandia Corp., Albuquerque, N. Mex.
DESIGN STUDY FOR HOMOGENEOUS PHOSPHORIC ACID REACTOR (HPAR) Rept. on Contract AT(29-1)789. Aug 60, declassified 7 Aug 62. 45p. 23 refs.

TID-14618 OTS $1.10

Union Carbide Nuclear Co., Oak Ridge, Tenn.
WHAT ARE YOUR TRUE OPERATING COSTS, by Alan M. Christman. Rept. on Contract W7405-eng-26. 14 Dec 61, 9p. 6 refs.

NDA-2132-5 OTS $3.00

United Nuclear Corp., White Plains, N. Y.
A STUDY OF WET STEAM AS A REACTOR COOLANT. Final rept. 1 Oct 59-30 Apr 61, on Contract AT(30-1)2303. 30 Oct 61, 217p. 69 refs. EURAEC-166.

GEAP-4054 OTS $11.00

Vallecitos Atomic Lab., General Electric Co., Pleasanton, Calif.
SUMMARY SAFEGUARDS REPORT FOR THE CRITICAL EXPERIMENT FACILITY VALLECITOS ATOMIC LABORATORY. Rept. on Contract AT(04-3)189. July 62, 143p.

Waste Disposal

TID-7646 OTS $2.25

Atomic Energy Commission. Div. of Reactor Development, Washington, D. C.
REPORT OF THE THIRD WORKING MEETING ON CALCINATION AND/OR FIXATION OF HIGH LEVEL WASTES IN STABLE, SOLID MEDIA AT WASHINGTON D. C., FEBRUARY 1-2, 1962, comp. and ed. by William H. Regan. Jan 63, 104p.

TID-16466(Pt.B) OTS $2.50

Institute of Marine Resources, U. of California, La Jolla, Calif.
THE STUDY OF THE BEHAVIOR AND SIGNIFICANCE OF CERTAIN RADIOACTIVE ISOTOPES FOUND IN THE SEWAGE TREATMENT PLANTS OF SELECTED CITIES. PART B: STUDY OF SHORT-TERM VARIATIONS AND BEHAVIOR OF CERTAIN GAMMA ACTIVITIES IN THE HYPERION TREATMENT PLANT (1960-1961), by T. R. Folsom and G. J. Mohanrao. Rept. on Contract AT(11-1)34. 15 May 62, 76p. 7 refs. IMR-TR-922-62-B.

PERSONNEL SUPPLIES AND PERSONAL EQUIPMENT

AD-294 449 repriced OTS $0.50

Arctic Aeromedical Lab., Fort Wainwright, Alaska.
FIELD TESTS OF TWO ANTI-EXPOSURE ASSEMBLIES, by Paul W. Barnett. May 62, 19p. 8 refs. Technical documentary rept. AAL TDR-61-56.

DESCRIPTORS: *Pressure suits, *Exposure suits, *Thermal insulation, Arctic regions, Protective clothing, Underwater clothing, Body temperature.

The purpose of this study was to determine the insulative value of the Navy MK-5 anti-exposure suit and the Air Force CSU4/P partial pressure suit in wet and dry cold environments. Human subjects were exposed to both environments while wearing each assembly. Results of these exposures are shown in graphs of skin and rectal temperatures. A discussion of the results is presented. The MK-5 and CSU4/P assemblies when used with additional protective equipment may be con-

sidered adequate protection for dry still air temperatures of -30°F. The MK-5 and liner is adequate protection for water survival in excess of 8 hours. The CSU4/P is adequate water survival protection for periods in excess of two hours. Additional insulation will increase the capability of either assembly during water immersion. (Author)

PHYSICS

HW-SA-2510 OTS $1.10

Hanford Atomic Products Operation, Richland, Wash.
INPUT AND SOURCE IMPEDANCE CORRECTIONS IN HIGH PRECISION VOLTMETER STANDARDIZATION, by I. T. Myers and D. M. Fleming. Rept. on Contract AT(45-1)1350. 20 Mar 62, 5p.

TID-13148 OTS $2.60

Los Alamos Scientific Lab., N. Mex.
A REFLECTING MICROSCOPE FOR TEMPERATURES TO ABOVE 2500°C, by D. M. Olson, B. B. Brixner, and M. C. Smith. Rept. on Contract W7405-eng-36. 12 July 61, 24p. LADC-4906.

PB 162 855 OTS $19.75

[Office of Research Administration] U. of Michigan, Ann Arbor.
THE EFFECT OF BOUNDARY REFLECTION ON THE ATTENUATION OF THERMAL RADIATION BY A DISPERSION OF OIL PARTICLES, by Stuart W. Churchill, Jin Ham Chin and others. Final rept. on Contract DA 18-108 cml 5515. Apr 56, declassified 2 Aug 57, 306p. 12 refs. Rept. no. 2277-11F; AFSWP-995; AD-113 316.

DESCRIPTORS: *Thermal radiation, Attenuation, *Oils, Fog, Particles, Optical properties, Boundary layer, Reflection, *Black body radiation, Latex, Glycols, Ethylenes.

Attenuation of thermal radiation by a dispersion of nonabsorbing particles bounded by a partially reflecting surface has been investigated theoretically and experimentally. Excellent agreement was found between the theoretical and experimental results. The greatest discrepancies were observed for small source heights, large angles of incidence, and dense dispersions as might be anticipated from the simplifying assumptions made in the theoretical formulation. The theoretical analysis indicated a bilinear effect for boundary reflectivity on attenuation. The effect of reflectivity was found to increase with density of the dispersion and to be nearly independent of position. The exact effect can readily be calculated for any specific position, dispersion, and surface reflectivity from graphical correlations in the report. For typical dispersions the transmission may be increased as much as 20 percent by a surface reflectivity of 25 percent. (Author)

AD-289 397 OTS $3.60

Ohio State U. Research Foundation, Columbus.
AN ANGULAR DISTRIBUTION OF VAPOR FLOWING FROM A KNUDSEN CELL, by V. Ruth and J. P. Hirth. Technical rept. no. 3 on Contract Nonr-495(26). Nov 62, 39p. 12 refs. RF Proj. no. 1386.

DESCRIPTORS: *Gas flow, Vapors, Molecules, *Kinetic theory, Vapor pressure, Surfaces, Low pressure research, Gas diffusion, Theory, Integral equations, *Vapor plating.

Surface diffusion has been shown by Winterbottom and Hirth to contribute to the integral effusion flow from Knudsen cells with orifices of small length to diameter ratios. The calculations are extended here to orifices of large length to diameter ratios. In addition, the spatial distribution of the effusion flow is determined. The results predict that there is less focussing of the effusion beam than predicted by the earlier corrections of Clausing. The results are shown to be in very good agreement with the recent determination by Günther of the distribution of silica effusing from graphite Knudsen cells with various orifice shapes. Correction factors for equilibrium vapor pressure measurements determined by the Knudsen technique are given for the experimental arrangements of Günther. (Author)

Electronics

NASA N63-12159 OTS $0.50

Goddard Space Flight Center, National Aeronautics and Space Administration, Greenbelt, Md.
THE IMPEDANCE OF AN ELECTRICALLY SHORT ANTENNA IN THE IONOSPHERE, by H. A. Whale. Jan 63, 11p. 4 refs. Technical note D-1546.

TID-16997 OTS $1.10

New York U., N. Y.
THE USE OF ATOMIC BEAMS AS A PROBE FOR STUDYING LOW DENSITY PLASMAS. Quarterly rept. 1 July-1 Oct 62, on Contract AT(30-1)2397. 15 Oct 62, 6p. 2 refs.

MATT-89 OTS $2.60

Plasma Physics Lab., Princeton U., N. J.
EQUILIBRIUM AND STABILITY FOR SYSTEMS WITH SMALL CURVATURE, by John L. Johnson, John M. Greene, and Katherine E. Weimer. Rept. on Contract AT(30-1)1238. July 61, 29p. 7 refs.

MATT-95 OTS $2.60

Plasma Physics Lab., Princeton U., N. J.
NONLINEAR COUPLED OSCILLATORS. I. PERTURBATION THEORY; ERGODIC PROBLEM, by E. Atlee Jackson. Rept. on Contract AT(30-1)1238. Aug 61, 21p. 13 refs.

AD-287 789 OTS $2.60

Stanford Electronics Labs., Stanford U., Calif.
PLASMA RESEARCH AT STANFORD ELECTRONICS LABORATORIES. Rept. on Contracts Nonr-225(24), AF 19(604)5480, AF 49(638)660, AF 33(616)7944, and AT(04-3)326. June 62, 22p. 22 refs. Rept. no. SEL-62-067.

DESCRIPTORS: *Plasma physics, *Electron beams, *Space charges, Ions, Electrons, Particles, Magnetic pinch, Electron tubes, Lithium compounds, Tantalium compounds.

This research is aimed at understanding some of the basic phenomena in current-carrying plasmas, including the two-stream a-c space-charge interaction between the electrons and ions of the plasma and the pinch effect in plasma beams. An understanding of some of these simple aspects of plasma behavior has been considered an essential first step toward the development of plasma devices based on the use of directed currents. Such device applications as microwave generation and amplification, noise generation for electronic-countermeasure systems, electrical propulsion of space vehicles, and controlled thermonuclear reaction devices are among those that are most likely to make use of the design concepts evolved from this research. (Author)

Molecular Physics and Spectroscopy

IS-424 OTS $1.60

Ames Lab., Iowa State U. of Science and Tech.
THE MASS SPECTRA OF SOME VOLATILE HYDRIDES, by F. E. Saalfeld and H. J. Svec. Rept. on Contract W7405-eng-82. 1962, 18p. 20 refs.

AD-280 532 OTS $1.60

Westinghouse Research Labs., Pittsburgh, Pa.
EXCITATION OF VIBRATIONAL AND ELECTRONIC LEVELS IN O_2 BY ELECTRON IMPACT, by G. J. Schulz and J. T. Dowell. Technical rept. no. 10 on Project Defender, Contract Nonr-2584(00) and 16 Mar 62, 19p. 20 refs. Scientific paper 62-908-113-P3 and ARPA Order no. 125-61, amd. 4.

DESCRIPTORS: *Oxygen, Excitation, Vibration, *Atomic energy levels, *Electron capture, Nuclear cross sections, Quantum mechanics.

Low energy inelastic collisions between electrons and oxygen molecules are studied using the trapped-electron method. Peaks in the trapped-electron current are interpreted as vibrational excitation of the oxygen molecule to the states v = 1 to v = 8. Two of these peaks can be attributed in part to the excitation of the $^1\Delta g$ and $^1\Sigma_g^+$ states. Approximate cross sections at 0.16 ev above threshold are less than 3×10^{-20} and 6×10^{-21} cm^2 for the $^1\Delta g$ and $^1\Sigma_g^+$ states, respectively. For electronic states above 5 ev, the cross sections at 0.16 ev above threshold are of the order of 10^{-18} cm^2. (Author)

Solid State Physics

AD-285 461 OTS $10.10

Energy Conversion and Semiconductor Lab., Mass. Inst. of Tech., Cambridge.
SPECTRAL RESPONSE AND CONVERSION EFFICIENCY OF P-N JUNCTIONS, by Bruce Daniels Wedlock (Doctoral thesis). Scientific rept. no. 3 on Contract Nonr-1841(78). 20 Aug 62, 122p. 55 refs. ARPA Order no. 214-62; DSR 8848.

DESCRIPTORS: *Semiconductors, Germanium, Power sources, Power supplies, *Photoelectric cells (Semiconductor), Solar cells, Heat, *Energy conversion.

HW-75501 OTS $1.60

Hanford Atomic Products Operation, Richland, Wash.
ELECTRICAL PROPERTIES OF ZrO_2 CORROSION FILMS. ELECTRICAL RESISTANCE MEASUREMENTS, by D. W. Shannon. Interim rept. no. 1 on Contract AT(45-1)1350. Nov 62, 18p. 6 refs.

IS-433 OTS $1.60

Institute for Atomic Research, Iowa State U. of Science and Tech., Ames.
ELECTRICAL PROPERTIES OF THE TUNGSTEN BRONZES, by H. R. Shanks, P. H. Sidles, and G. C. Danielson. Rept. on Contract W7405-eng-82. 21 Mar 62, 18p. 10 refs.

IS-359 OTS $6.60

Institute for Atomic Research Iowa State U. of Science and Tech., Ames.
THE EQUATION OF STATE OF SOLIDS AT LOW TEMPERATURE, by N. Bernardes and C. A. Swenson. 13 Oct 61, 64p. 81 refs.

TID-13145 OTS $1.10

Los Alamos Scientific Lab., N. Mex.
BOND LENGTHS IN SOLID HELIUM, by A. F. Schuch. Rept. on Contract W7405-eng-36. 1961. 3p. 6 refs. LADC-4912.

AD-289 109 OTS $1.60

North Carolina U., Chapel Hill.
STUDIES OF POINT DEFECTS IN SILVER CHLORIDE, by H. Layer and L. Slifkin. Rept. on Contract AF 49(638)865. [1962] 11p. 16 refs. AFOSR-2644; TID no. 16132; NASA N62-17432.

DESCRIPTORS: *Silver compounds, Chlorides, *Single crystals, Plasticity, Cooling, High temperature research, *Crystal lattice defects.

Experiments on excess point defects introduced into single crystals of silver chloride by pulsed plastic extension or by rapid cooling from high temperature yield the following results. Point defects are created by plastic deformation much less efficiently in silver chloride than in other substances that have been studied. Interstitial silver ions so produced have a lifetime of the order of 10^8 jumps. Rapid cooling of very pure silver

chloride quenches in approximately 0.1% Schottky defects. The silver and chloride vacancies are almost completely associated at room temperature. These divacancies have an activation energy for migration of 23 kcal/mole and a dissociation energy of 9.8 kcal/mole. (Author)

AD-280 795 OTS $1.10

W. M. Keck Lab. of Engineering Materials, Calif. Inst. of Tech., Pasadena.
DENDRITIC CRYSTALLIZATION OF AN AMORPHOUS ALLOY, by R. H. Willens. Technical rept. no. 4 on Contracts AT(04-3)-221 and Nonr-220(30). Apr 62, 9p. 4 refs. TID-15816; NASA N62-11852.

DESCRIPTORS: Alloys, *Germanium alloys, *Tellurium alloys, *Crystallization, Electron microscopy, X-ray diffraction analysis.

Thermodynamics

IS-327 OTS $3.60

Ames Lab., Iowa State U. of Science and Tech.
THE HIGH TEMPERATURE HEAT CONTENTS AND RELATED THERMODYNAMIC PROPERTIES OF LANTHANUM, PRASEODYMIUM, EUROPIUM, YTTERBIUM AND YTTRIUM, by J. R. Berg, F. H. Spedding, and A. H. Daane. 1961. 35p. 28 refs.

BNL-6177 OTS $1.60

Brookhaven National Lab., Upton, N. Y.
WALL AND BULK TEMPERATURES FOR FLUIDS FLOWING IN CONCENTRIC ANNULI, by O. E. Dwyer. 28 May 62, 11p. 3 refs.

AD-289 113 OTS $3.60

Delaware U., Newark.
SELF-DIFFUSION COEFFICIENTS OF CARBON DIOXIDE AT 1180-1680°K, by G. Ember, J. R. Ferron, and K. Wohl. Technical rept. on Contract Nonr-1858(25). Mar 62, 34p. 19 refs. Proj. Squid Technical rept. DEL-12-P.

DESCRIPTORS: *Carbon dioxide, Diffusion, Viscosity, *Transport properties, Gases, Kinetic theory, Radioactive isotopes, Diffusion theory, Turbulent flow.

Self-diffusivities of carbon dioxide at 1180-1680°K have been determined by a new version of the continuous flow method. Results can be correlated with previous low-temperature data (mean error 1.5%) in terms of a single set of parameters of the Lennard-Jones (6-12) potential (σ = 2.70 Å, ε/K = 871°K) valid for the entire temperature range (195-1680°K). Literature values of viscosity (200-1500°K) may also be correlated by a single set of parameters (σ = 3.94 Å, ε/k = 200°K). One can correlate both viscosity and self-diffusivity data if the non-sphericity of the CO_2 molecule, which is shown to have the strongest effect at high temperatures, is accounted for. This can be done approximately by use of the non-sphericity factors calculated by Curtiss and coworkers for rigid, spherocylindrical molecules. (Author)

TID-15183 OTS $2.60

Los Alamos Scientific Lab., N. Mex.
HEAT CAPACITY OF PLUTONIUM DIOXIDE BELOW 320°K, by Thomas A. Sandenaw. Rept. on Contract W7405-eng-36. 19 Mar 62, 25p. 24 refs. LADC-5260.

LADC-5487 OTS $1.60

Los Alamos Scientific Lab., N. Mex.
THE THERMODYNAMIC PROPERTIES OF THE URANIUM AND PLUTONIUM CARBIDES, by Charles E. Holley, Jr. Rept. on Contract W7405-eng-36. 10 Oct 62, 19p. 18 refs.

TID-14538 OTS $1.60

Los Alamos Scientific Lab., N. Mex.
THERMODYNAMICS OF $PuCl_4$ FROM TRANSPIRATION DATA, by R. Benz. Rept. on Contract W7405-eng-36. 16 Jan 62, 13p. 16 refs. LADC-5161.

RESEARCH METHODS, TECHNIQUES AND EQUIPMENT

OTS SB-510 $0.10

Office of Technical Services, Dept. of Commerce, Washington, D. C.
MANAGEMENT PLANNING AND CONTROL TECHNIQUES: PERT, CPS, CPM, PEP, LESS, TOPS, CRAM, SCANS, COMET, PROMPT, ETC. Jan 63, 6p. 42 refs. OTS Selective Bibliography SB-510.

DESCRIPTORS: *Management engineering, Control systems, *Bibliography, *Scheduling

Lists 42 references on various new management techniques for planning, scheduling, implementing, directing and controlling projects. These techniques are especially useful as working tools for management and engineers on engineering and scientific research & development projects, but can also be applied to the fields of industrial production, scheduling and programming, accounting, procurement, new product design, etc. Includes reports on Program Evaluation and Review Technique (PERT), Critical Path Scheduling (CPS), Critical Path Method (CPM), Program Evaluation Procedure (PEP), Least Cost Estimating and Scheduling (LESS), Integrated Master Programming & Scheduling (IMPS), The Operational Pert System (TOPS), Contract Requirement Recording Analysis & Management (CRAM), Program Management Planning Techniques (PROMPT), Scheduling & Control by Automated Network Systems (SCANS), Project COMET. (Author)

TID-17373 OTS $1.60

Sandia Corp., Albuquerque, N. Mex.
GEOMETRICAL AND PHYSICAL LIMITATIONS IN METROLOGY, by J. C. Moody. Rept. on Contract AT(29-1)789. Nov 62, 19p. SCDC-2871.

PB 181 412 $1.25, $10.00/year

Naval Research Lab., Washington, D. C.
REPORT OF NRL PROGRESS. Apr. 63.

DESCRIPTORS: *Naval research, *Scientific research, Electron diffraction analysis, Molecules, Excitation, Radar, Atmosphere, Astrophysics, Venus, Brightness, Ionosphere, Chemistry, Slags, Boilers, Corrosion, Ionization, Electric potential, Elastomers, Friction, Primary cells, Silver, Electrodes, Shock waves, Wire, Underwater, Mechanics, Hardening, Fracture (Mechanics), Nonlinear systems, Metallurgy, Ceramic materials, Steel, Fatigue (Mechanics), Copper, Niobium, High temperature research, Stresses, Thin films, Ferromagnetic materials, Radiation effects, Neutrons, Titanium, Titanium alloys, Aluminum, Cathodic protection, Nuclear physics, Cosmic rays, Radio, Switching circuits, Coding, Radar display systems, Frequency, Solid state physics, Alkali metal halides, Dipole moments, Crystals, Dielectric properties, Magnetic properties, Resistance, Radiochemistry laboratories, Penscopes, Shielding, Scientific reports, Patents.

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Nuclear and Atomic Physics: On the primary cosmic radiation
Radio: Modular additive decimal codes for multiple valued logic switching systems. Four-frequency radar master display console
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